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apc video

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Tim Buntel.



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First test

64-bit Pentium
Full Labs report inside

10 PDA phones compared

+ wide-screen notebooks & Athlon 64 mobs



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- > Share printers across a LAN
- > Remote access with Linux

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Top products in 15 key categories

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Darren Yates
Australian PC User Magazine
March 2005

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Australian PC World, April 2005

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*Source: RMIT Test Labs, August 2004.



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Project Manager, Department of Foreign Affairs, Switzerland

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Microsoft Windows Server System makes it easier for Switzerland's Federal Department of Foreign Affairs (DFA) to manage the infrastructure serving their embassies and consulates in 156 countries. Here's how: By using Systems Management Server 2003 and Microsoft Operations Manager 2005, DFA can automatically update its 500 remote servers from a central location, saving over \$780,000 in travel expenses alone in the past year. They've also been able to reduce the time and cost of maintenance, boost user productivity, and find the time to better prepare for expansion. Software that's easier to manage is software that helps you do more with less. To get the full DFA story or to find a Microsoft Certified Partner, go to microsoft.com.au/wss



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IBM recommends Microsoft® Windows® XP Professional for Business.



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Toshiba. The new model release.



Tecra M3



Tecra S2



Tecra A3



Tecra A4

OBSERVATION: The technology is here for notebook computers to take the next great leap.

OBJECTIVE: Take Toshiba's renowned engineering and design, rugged protective features, thermal management expertise and connectivity; add the latest processing technology, and incorporate it into new model notebooks that take the idea of portability, and transport it.

RESULT: New models:

Tecra M3, encased in tough magnesium alloy, it's the lightweight notebook built for business.

Tecra S2, high performance, a long product cycle and a consistent software image mean lower total cost of ownership.

Tecra A3, feature-packed notebook with the option of Intel® Centrino™ Mobile Technology for connectivity on the move.

Tecra A4, the widescreen desktop alternative; portable productivity with graphics accelerator and super-connectivity.

Portégé M300, the sleek, ultra portable, with its unique 3 dimensional drop detection sensor and long battery life*.

The Portégé M300 is not only 'freefall tested' onto a steel slab, its 3D accelerometer sensor detects movement in any axis and is designed to retract the heads, protecting data on the Hard Disk.



Portégé M300

CONSIDERATION: Mobility. It's all we do, so we think it through.

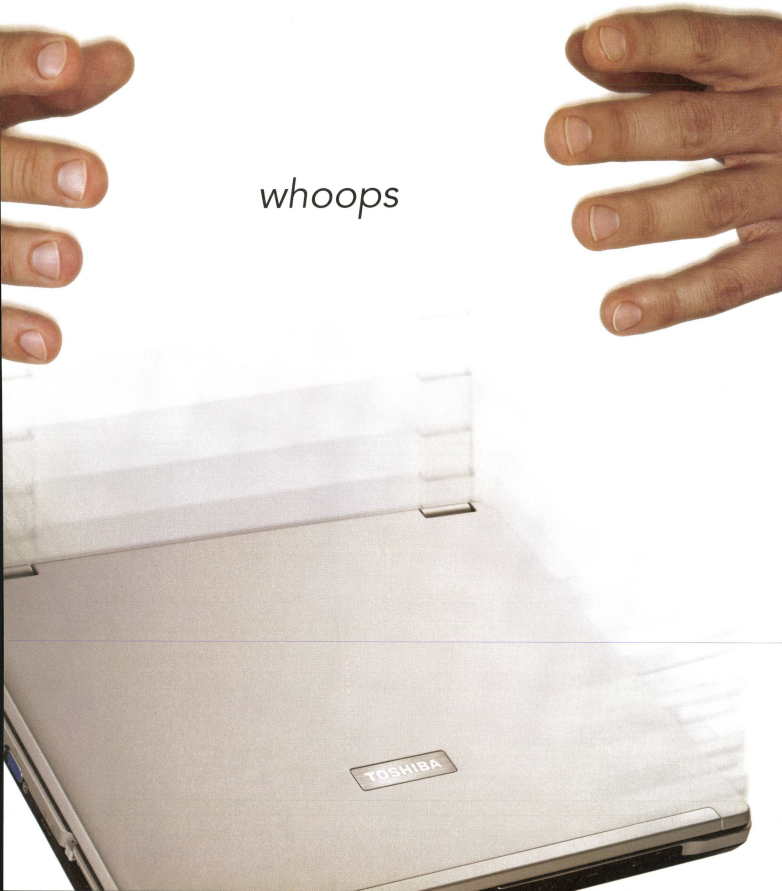
ACTION: For more information on these models as well as the stunning Portégé M200 Tablet PC and the ultimate ultra portable Portégé R100 Notebook PC, see your nearest Toshiba Authorised Reseller, visit www.isd.toshiba.com.au or call 13 30 70.

TOSHIBA

Toshiba recommends Microsoft® Windows® XP Professional.



whoops





This month's cover stories

Build a complete PC for \$599

Or a sub-\$1,999 powerhouse

Armed with steely determination, a wad of unmarked banknotes and a toolkit, APC set out to build two budget PCs that will kick retail PC butt.



81

64-bit Pentium

40

Intel joins the 64-bit race, ushering in a new wave of computing to boot. *Matthew Overington* checks out the new range.

10 PDA phones compared

60

Can a PDA and mobile phone really combine to make one super gadget? *Anthony Caruana* road-tests 10 units.

Workshops

102

Daniel Winter shows how to resynchronise out of kilter audio and video tracks; *Paul Schnackenburg* gets into Snort; and *Caroline Leming* and *Anton Tomazin* demonstrate how to set up a basic MySQL database using Linux.

Best Buys

56

Stay on top of product releases with APC's monthly run-down of the best of the best.

Glitch-free VoIP

24

Is sound quality being forgotten in the rush to move telephony to VoIP? *Dan Warne* investigates.

Bagging a bargain (without getting burnt)

28

Few industries are as price-sensitive as computing. But be warned, cheap goods aren't always value for money according to *Jeanne-Vida Douglas*.

Mote control

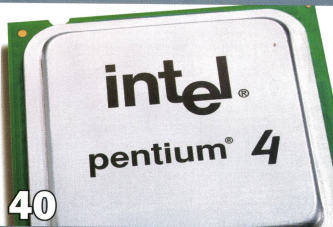
94

The paranoid among us believe spies are everywhere, but the latest gadgets from wireless researchers could prove them right. *David Braue* dives into the tiny world of motes.

Broadband directory

99

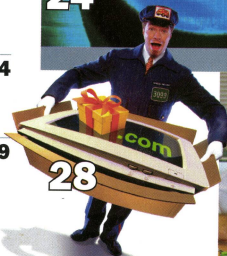
Bring out your carcasses: wireless broadband provider Unwired wants your 56K modem dead.



40



24



28



94

On Test



Reviews



Hardware

Intel 6xx series hardware
Mitsubishi Electric Diamond Digital networking products
Mitsubishi Electric DiamondPoint UX21LCD monitor



Konica Minolta magicolor 2400W laser printer
Iomega REV Serial ATA drive
Sitecom USB 2.0 Universal Dock
XpertVision Nvidia GeForce 6200



Software

Red Hat Enterprise Linux 4
Registry Mechanic 4.0



System

Apple Mac mini
AOpen XC Cube AV EA915
ASUS W5G00A notebook
Hush Technologies Hush E3 MCE



Best buys

All the top products in their fields

apc Labs Challenges



System

Sub-2kg wide-screen notebooks

Hardware

Nvidia nForce4 Ultra and SLI motherboards
PDA phones



Starts page 39

Need to Know

Technotes Exchange Feature

Broadband barriers smashed
Peter Tippet
Glitch-free VoIP
Bagging a bargain
(without getting burnt)

Opinion

Justin Kranzl
Mary Jo Foley

Watchdog Epinions

Customer service issues
Readers' letters

Starts page 17

WORKSHOP

Internet Networking Multimedia Security Linux

Set up a Web server
Printer sharing
Re-synchronising audio
Intrusion detection
Remote access
Mastering Linux, pt 6
MySQL

Starts page 102

Down time

Gear

Small cameras
Noise-cancelling headphones
Old-school handsets for mobiles
PhotoVault
Digital paper
Portable TV tuner
12-in-1 hub

Books

Learn XP from bikini girls
Notebook speakers
Hardening Linux
Windows XP Just the Steps for Dummies
Degunking your Email, Spam and Viruses
Beginning XML 3rd Edition
Game Console Hacking
Playboy: The Mansion
Star Wars: Knights of the Old Republic II: The Sith Lords
Nexus: The Jupiter Incident

Games

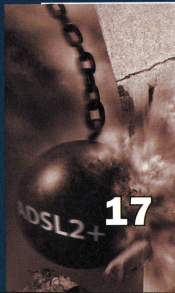
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7 CDs' worth of software on DVD ROM



Borland Delphi 2005 Personal

Exclusive for APC readers from Borland: a full-working version of Borland's Delphi 2005 Personal edition, widely regarded as one of the best and most complete integrated development environments for Windows applications, now also featuring support for .NET development. This is a full product that comes with a "Personal" licence, which means you can use it for application development if you're an individual rather than a business entity.



Dekart Private Disk 2.02

Keep prying eyes away from your private and confidential data. With Dekart Private Disk, you can create encrypted disk partitions with a 128-bit AES encryption algorithm to keep your data secure. But what makes Dekart Private Disk unique is its seamless integration into Windows, which allows you to easily move encrypted information to any removable media and work with your encrypted files on any computer. Previously sold for US\$45, this version is free for APC readers this month.



SimplyMEPIS 3.3

SimplyMEPIS is the OS of choice for our \$599 PC (see cover story) because it has some unique features which make it one of the best new Linux distros. It can be booted directly from disc or installed as normal, so it gives readers with a Windows PC a chance to try it without having to reformat the hard drive. It's a complete desktop system, with all the open source apps you'll ever need to run a productive desktop. It also includes cool features like an iPod manager.



Full DVD index



This logo indicates a free, complete and unrestricted software package, available only on APC's cover DVD.



When you see this icon in APC, it means there's bonus software on the cover disc.

Need help?

- While we've taken all care in selecting the software and testing the DVD, APC cannot accept responsibility or liability.
- APC does not provide technical support for programs installed on the DVD.
- Technical problems? Email: dvd@apcmag.com

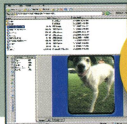
- Ad-Aware SE Personal Edition 1.05
- Adobe Reader
- Apache 2.0.53
- ATI Catalyst Display Drivers 5.3
- AVG Anti-Virus Free Edition 7.308
- Bart's PE Builder 3.1.3
- BigFix Consumer Edition v1.7.6.0
- Borland Delphi 2005 Personal
- Buzzsaw v2.0.0.2
- CD Burner Pro XP 3.0.116
- Cerberus FTP Server 2.22
- Dekart Private Disk 2.02
- Empire Earth II Demo
- Engage Security IDScenter 1.1 RC4
- ExplorerView 2.2
- Filzip 3.01
- HD Tune 2.10
- hKSFV 2.0.1
- Inmatrix Zoom Player 4.03
- Intel 915 and 925 Marvell Yukon Gigabit Ethernet Controller Driver 7.24.1.3

- Intel Application Accelerator Driver for 915 and 925 Chipset-based motherboards 4.6.0.758
- Intel Graphics Drivers for Motherboard Based Graphics Adaptors for Windows 2000 and XP v14.9
- Intel HD Audio Controller Driver (Realtek Codec) 5.10.0.5034
- Intel INF Update Utility 6.3.0.1007
- Intel RAID Windows Install Floppy Disk 4.6.0.6758
- Linux Kernel 2.6.11
- Macromedia Flash Player 7
- Memtest86 3.2
- Microsoft .NET Framework 1.1
- Microsoft DirectX 9.0c
- Microsoft Internet Explorer 6 (SP1)
- Mozilla Firefox 1.0.1
- MySQL 4.1
- Nvidia ForceWare 66.93
- Nvidia Unified nForce Drivers Windows 2000 v4.27
- Nvidia Unified nForce Drivers Windows XP v5.10
- OpenOffice 1.1.4 — Linux version
- OpenOffice 1.1.4 — Windows version
- OpenSSH 3.9

ExplorerView 2.2

ExplorerView 2.2 is a unique add-on for Windows Explorer that lets you preview documents, pictures, movies and music in the same window.

APC readers are entitled to a 50% discount off the latest version.



SAVE
50%

Entertainment

Try large demos of hot new stealth games. Tom Clancy's Splinter Cell 3: Chaos Theory takes you to 2007, when the world is experiencing global information warfare. In Star Wars: Republic Commando you're a squad leader of a Republic Special Operations unit, leading your team on precision operations deep behind enemy lines. We also have a trailer for the Doom 3: Resurrection of Evil expansion pack, in which players battle new demons.



Utilities

This new section is a combination of the Power Kits (which normally relate to software mentioned in a feature in the print magazine) and Tool Kits (a themed collection of freeware). Within Utilities are some of the key categories you'll need to maintain and repair your PC.

- Opera 7.54u2
- proftpd-1.2.10
- RealNetworks RealPlayer 10
- Restoration 2.514
- SimplyMEPIS 3.3
- Splinter Cell 3: Chaos Theory Demo
- Snort 2.3
- Spybot — Search & Destroy 1.3
- Star Wars Republic Commando Demo
- Sun Java 2 Runtime Environment
- The GIMP 2.2.4 — Linux version
- The GIMP 2.2.4 — Windows version
- TweakNow RegCleaner 2.0.3
- VIA DriveStation Advanced Controller Suite v4.10a
- VIA Ethernet Controller Driver v40F
- VIA Hyperion Drivers — 4in1 455vpi
- VIA KBM800 Integrated Graphics Device Driver v16944206
- VirtualDub 1.5.10
- VirtualDubMod 1.5.10.1
- VNC Free Edition 4.1 for Linux (x86)

- VNC Free Edition 4.1 Viewer for Windows
- Windows Media Player
- Windows Ultimate Boot CD 2.4.1
- WinPcap 3.0
- ZoneAlarm 5.5.062.011

Workshop PDFs

- Mastering Linux, part 6
- Mastering Linux, part 5
- Mastering Linux, part 4
- Mastering Linux, part 3
- Mastering Linux, part 2
- Mastering Linux, part 1
- Linux Cheat Sheet PDF

APC Video

- Doom 3: Resurrection of Evil game trailer.
- Green Day: the making of the *American Idiot* clip.
- Interview with Tim Buntel, Macromedia ColdFusion product manager.

Video

This month we introduce a new video interview format where you can just watch the parts you're interested in, rather than watching the interview end-to-end. Featured is Macromedia ColdFusion's product manager Tim Buntel, who was in Australia for the MX Downunder conference.

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Perks of the job

As an editor, I'm constantly forced to use the technology this magazine writes about. I try and do that in a realistic setting, so often I take it home and inflict it on my family. One technology I've been dreading introducing into the household is VoIP. My wife puts up with a lot, but she'll put her foot down if the quality of phone calls is degraded.

My experiences with VoIP in a business context have not been encouraging. PC Tools, an Australian software company, uses VoIP on its business phone system. I can't remember one conversation in which the voice at the other end hasn't suddenly become hollow, started echoing and then disappeared altogether. Presumably that's because someone was downloading a big file somewhere on the same bandwidth.

Not one VoIP spruiker I've met has actually recommended using VoIP to replace a landline, even if you have a cable connection and can bypass a PSTN line completely. One VoIP speaker said that it would be foolhardy to replace a

corporate PBX with a VoIP PBX in case the server went down. All this has had me wondering why anyone should bother.

Dan Warne's special, "Glitch-free VoIP" on page 24, is illuminating. He explains what causes the quality problems, how they can be rectified and why VoIP is worth setting up if you want to save money making outgoing calls. And down the track, there's the potential to do some amazing things with VoIP, like receiving and making calls from your laptop whenever you're in a Wi-Fi hot spot. Now that's interesting.

Also this month, we've partnered with Borland to bring you Delphi 2005, the latest full-working Personal version of this premier integrated development environment (IDE) for Windows, on the cover DVD. What's important is the unique Personal licence which lets you develop applications as long as you do so as a private individual. It's the perfect way to find out why Delphi is one of the premier Windows IDEs.

EDITORIAL

Editor Tony Sarno tsarno@apcmag.com
Deputy Editor Garth Montgomery gmontgomery@apcmag.com
Lab Editor William Maher wmaher@apcmag.com
Technical Editor Matthew Overington moverington@apcmag.com
News and Features Editor Dan Warne dwarne@apcmag.com
Journalists David Emberton demberton@apcmag.com,
 John Gillroy jgillroy@apcmag.com,
 Nick Rance nrance@apcmag.com
Contributors James Bannan, Anthony Caruana, Alan Crawford, Tim Dean, Jeanne-Vivie Douglas, David Braun, Mary Jo Foley, Tim Gaden, Jude Hungerford, Angus Kidman, Justin Krazel, Caroline Leming, Paul Schackenberg, Jarrod Spiga, Antonio Tomazini, Daniel Winter, Stephen Withers
Editorial Coordinator Helen Chen hchen@apcmag.com

DESIGN

Senior Graphic Designer Patrick Kirsh
Graphic Designer Craig Carroll
Photography Patrick Kirsh, Getty Images, AAP

PRODUCTION

Production Editor Peila Duggan
Sub-Editors Stuart Hitchings, Tamara Pienaar
Production Controller Leanne Collins

MULTIMEDIA

DVD Editor Lachlan Grant lgrant@apcmag.com
Web and Database Manager Dan Lowden dlowden@apcmag.com

ADVERTISING

National Advertising Manager Chris Greenwood cgreenwood@apcmag.com
NSW Advertising Manager Martin Brown mbrown@apcmag.com
Vic Advertising Manager Matthew Havel mhavel@apcmag.com
Advertising Sales NSW Nathan Hill, Annette Judd, Adam Stead, Janice Tong, Alex Vella
Advertising Production Jackie McCarthy
Advertising Enquiries (02) 9288 9149

MARKETING

Marketing Brand Manager Dan Pugh dpugh@apcmag.com

ACP

CEO John Alexander
Group Publisher Phil Scott
Associate Publisher Lucinda Mitchell

CONTACTING US

Email apc@apcmag.com **Web** www.apcmag.com
Phone (02) 9288 9111 **Fax** (02) 9267 4909
Postal PO Box 4088, Sydney NSW 2001
Street Level 9, 175-183 Castlereagh Street, Sydney

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watchdog@apcmag.com ejinions@apcmag.com

REPRINTS AND COPYRIGHT

Contact Helen Chen **Phone** (02) 9288 9105

SYNDICATION ENQUIRIES

London John Slater
Phone 44 20 7812 6527 **email** jslater@aspuk.com
Sydney Greg Allen-Waters
Phone 612 9282 8808 **email** gallen-waters@apcmag.com

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Need to Know

News, views and analysis from the IT world

Broadband barriers smashed

The national ADSL broadband network is set to be upgraded to the next-generation 24Mbit/s speed, reports **Dan Warne**.

Telstra has announced that it intends to upgrade DSLAMs in exchanges around Australia to support the next-generation ADSL2+ standard. The upgrade should be complete by mid-2006. The company is also trialling an ADSL distance extension which will dramatically boost its reach from phone exchanges from 4km to 20km. The distance extension uses a new ruggedised micro-DSLAM small enough to be installed in a street-side pit, on a power pole, or even on a customer's home. The trial finishes at the end of May.

Although the telco already uses a similar technology called mini-CMUT to bring ADSL to remote locations, it requires an expensive fibre optic feed back to the main exchange.

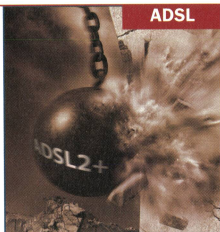
Telstra is starting to feel the pressure from competitors

The new micro-DSLAMs use the plentiful copper phone lines to create a super high-speed DSL (SHDSL) link.

The breakthroughs in speed and coverage come at a time when Telstra's competitors are installing their own broadband infrastructure around the country.

Its biggest competitor, Optus, is in the final stages of gaining approval from parent company SingTel for the rollout of an alternative ADSL network, initially covering the top 300 exchanges.

National ISP Internode's sister company, Agile Communications, recently announced a rollout of DSLAMs to 47 of the country's most densely-populated exchanges, offering the fastest residential broadband currently ▶



Breaking the barrier: super high-speed DSL from the Telstra network might soon be a reality.

Also in Need to Know:

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The person behind Norton AntiVirus wasn't Peter Norton... it was Peter Tippet.

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Is sound quality being forgotten in the rush to move telephony to VoIP? Dan Warne investigates.

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Few industries are as price-sensitive as computing. But be warned, cheap goods aren't always value for money according to Jeanne-Vida Douglas.

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Is ICANN's new domain transfer process making domain theft easier than ever?

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The mini Mac is here, and Justin Kranz! reckons it should have Microsoft running scared. In the war for the best browser, Mary Jo Foley believes Firefox can outfox Internet Explorer.

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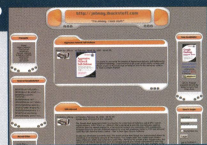
Have you been Googlehacked?



Unlike Googlehacking, which involves finding search terms that return only one result, Googlehacking exploits the vast quantity of

information that Google has indexed — but perhaps shouldn't have. The Googlehackers at <http://johnny.hackstuff.com> have found complete password lists, credit card numbers, unpatched servers vulnerable to known exploits and live municipal surveillance cameras that can pan and scan under your control.

Googlehacking works by searching terms known to be found in the target information. It has given privacy



Secret's out: Google is better than it thinks it is.

advocates a vivid example of the consequences of one entity doing wide-scale indexing of the world's information, begging the question: has Google made things too easy to find?

Dan Warne

Is it legal...

... to record a VoIP call?

Voice over IP allows phone calls to be made over the Internet by slicing a conversation audio stream into data packets which are reassembled at the other end and connected to the phone network. VoIP software makes it easy to record these online phone calls for later use. But is it legal?

The popularity of VoIP has presented a challenge for regulators. In the US, the Federal Communications Commission last year ruled that Web-based VoIP services should be classified as unregulated and hence not covered under wire-tap laws. As it stands, it is illegal to intercept VoIP calls under Australian communications law, but VoIP providers are lobbying for services to be largely unregulated.

Alan Crawford is a lawyer with Henry Davis York

alan_crawford@hdy.com.au

Disclaimer: this does not constitute legal advice. Seek advice if an issue concerns you.

Pirate Windows users to walk the plank



Microsoft prepares to lock out bootlegged copies of its OS.

From next month, users with pirate copies of Windows will be locked out of most Microsoft updates as the company introduces a new layer of product activation.

Microsoft's validation scheme, euphemistically dubbed Windows Genuine Advantage, is already compulsory in some countries, where up to 40% of users have been unwilling to submit their copy of Windows to the validation test when downloading updates from Microsoft's Web site. Now the scheme is set to become compulsory worldwide. People who want access to software patches and updates to Windows add-ons such as DirectX will need to validate themselves as owners of a genuine copy of Windows.

Even the corporate version of Windows, the most popular among software pirates because it doesn't require product activation, will be included in the scheme. David Lazar, director of the Windows Genuine Advantage project, confirmed that



Microsoft mutiny: no more patches for pirates.

Microsoft's browser-based ActiveX control will scan computers and mark as illegitimate those corporate versions registered with an illegally-generated or leaked volume licensing key.

Some analysts fear that blocking pirated copies of Windows from the latest security patches could lead to a sub-class of PCs that act as Petri dishes for viruses which could attack legitimate users. But Microsoft says it will allow users with pirated copies "limited access" to its security updates for an unspecified time through its automated update process. "It is not our intention to limit security updates with Windows Genuine Advantage at this point in time," according to Suzanne Caldwell, the licence compliance manager for Microsoft Australia.

Microsoft has not ruled out widening the scheme to include its Office software and other products.

Tim Gaden



Broadband barriers smashed

available in Australia. Speeds automatically train up to 12Mbit/s if the phone line signal loss is low enough.

Most customers will get around 10Mbit/s. The DSLAMs use the new ADSL2 standard.

Agile's high-speed plans start at \$59.95 with 15GB of data — staggeringly low compared to broadband based on Telstra's wholesale network. Internode MD Simon Hackett admitted the low price points were established partly to highlight that operators could offer better value broadband if the services weren't based on Telstra's network.

The third-largest ISP behind Telstra BigPond and OptusNet, iiNet, also revealed a 200 exchange, Australia-wide ADSL rollout, due for completion by the end of this year. It will offer up to 8Mbit/s — the maximum

speed the ADSL1 standard allows. However, if customers don't also take iiNet's long distance telephony service, they are limited to 1.5Mbit/s. In response to Internode's rollout, iiNet said it would commence trials of ADSL2 straight away.

In a sign that Telstra is starting to feel the pressure from wireless competitors, the telco successfully took wireless upstart Unwired to court over what it said were misleading claims about ADSL coverage, forcing Unwired to change its advertising. Telco analyst Paul Budde said Telstra appeared to be deliberately targeting DSL blackspots in Sydney, where Unwired operates. "Before the launch of Unwired these black spots might have covered about 25% of Sydney," Budde noted. "Currently they constitute less than 5%." Telstra's Rod

Bruem refuted Budde's claim, saying, "Telstra doesn't factor competitors' plans into our ADSL rollout."

Another wireless network, iBurst, has switched on its network in Melbourne, providing Victorians with their first taste of mobile wireless broadband. Its network services inner-city suburbs such as Brunswick, Richmond and Newport, and has patchy coverage as far as Diamond Creek and Broadmeadows. CEO Jim Cooney said iBurst aims to ramp up the wireless network's speed to 8Mbit/s within the next three years to keep up with ADSL.

Both Optus and Telstra are continuing their trials of dedicated wireless broadband technologies, using the USTarCom and Flarion technologies respectively, with the tantalising prospect of broadband coverage issues being largely resolved within the next 12 months.

Auctions

eBay rushes Oz fraud protection



Online auction site bends to user pressure over fraud protection.

Concerns over auction scams have forced eBay to extend fraud protection options for its PayPal online payment system just weeks after its much-hyped entry into the Australian market.

PayPal Australia launched in January, allowing online auction junkies to trade in Australian currency via a local site, www.paypal.com.au. When it debuted, the PayPal Buyer Protection program was not included, and eBay executives played down its relevance to Australians. But within weeks of the launch, the protection scheme was bolted on to the local operation. "Typically, when we launch PayPal in overseas markets, we launch with basic functionality and core features and then look at what are the most appropriate other programs," PayPal Australia managing director Andrew Pipolo told APC.

Under the program, high-volume customers can claim back up to \$1,500 if they fail to receive goods paid for via PayPal. Sellers only qualify if they have a high percentage of positive feedback. The scheme does not apply to non-tangible goods.

Since it launched in 1995, eBay has placed increasingly onerous restrictions on its fraud protection schemes, which haven't always left buyers happy. Melbourne university student Thanh Quy Ngoc Le is engaged in a dispute over a non-delivered notebook, claiming that eBay had



No friend of mine: controversy over PayPal continues.

made little effort to help him. "I reported the fraud to eBay but I just received a form to fill in," he said, adding that eBay had not provided him with any information regarding the investigation's progress.

PayPal may have a tough sell in Australia. "I don't see the point of signing up for PayPal if I'm not going to sell to overseas buyers," one regular eBay user commented. "Although eBay says that it's an easy way of paying, what could be easier than sending a money order? It doesn't cost me or the buyer [PayPal commission fees], just a flat post office charge and a 50 cent stamp for the buyer."

Angus Kidman

eBay addiction: when to seek help



When Pierre Omidyar sent his online auction site live in 1995, little did he realise he was unleashing a social phenomenon that would eventually evoke

its own social problems — for some.

Have you moved to the outer suburbs to squeeze in the extra furniture? Do the bags under your eyes betray your bidding techniques? If so, it's time to face your demons and admit to having fallen victim to eBay addiction.

Jeanne-Vida Douglas

FIVE SIGNS OF AN EBAY ADDICTION

- 1 It's 4.30am and you've been up for an hour duelling with lazzylizzie433 over a case of Duff beer — for the third time this week.
- 2 You have Australia's largest stock of original 1970s Soda Stream canisters.
- 3 You understand and use the phrase "accidentally won", and there's a spare room in your house to prove it.
- 4 You know you've found a kindred spirit when they open a conversation by telling you their feedback score.
- 5 Garage sale = assorted domestic items, all in good condition, will arrange for local pick-up only (no postage), COD.



DECODE

HVD

What is it? While heavyweights argue the tech specs of Blu-ray, Optware is trumpeting its Holographic Versatile Disc, an optical disc that can store 1TB — the equivalent of 20 Blu-ray discs.

Should you care? Sony may have had the best video format in the world, but VHS still won over Beta. HVD doesn't have a particularly impressive suite of companies behind it yet — Fuji Photo is the best known.

APC Verdict: Holographic storage is like a mirage in the desert: just when you think you've got there, you realise it's still vapourware.



PC mini lacks a little

Kevin Rose made waves in the Apple community when he shoehorned a nano-ITX PC motherboard into a Mac mini case just days after its release. Rose described how to saw the x86 CPU heatsink in half, install an extra fan and cut a hole in the case to fit the lot in. However, he admitted in a footnote: "Due to size restrictions, fitting a CD-ROM drive in the enclosure would be impossible." Except for one small thing: Apple already has.

Dan Warne

Want to nominate a dumbest moment in tech?

Send an email with the subject line Dumbest Moments to dwarne@apcmag.com.

All correspondence becomes the property of APC.

In brief news



VIDEO NOW ON DEMAND
ISP TransACT has unveiled what it claims is Australia's first true video-on-demand service, with subscribers able to watch movies at any time over its hybrid fibre/VDSL network. Although TransACT only has coverage in the ACT, it's a sign of what ISPs with their own high-speed DSLAMs will be able to offer.

ELECTRIC TOOTHBRUSH POWER
US firm SplashPower is about to start selling a "charging pad" that can be built into cars, desks or airport tray tables and allows devices to be charged simply by resting on it, similar



to an electric toothbrush charger. Expect a commercial launch later this year.

BYE BYE BLUETOOTH, HI WI-FI
Bluetooth is being dumped from product lines in favour of longer-range, faster and cheaper Wi-Fi. A number of manufacturers are shipping printers with built-in Wi-Fi servers so users on a network can send documents to a printer stashed in a cupboard.



Fanatic

The case of the fan of cases of case fans.

Travis Hydzik, a 21-year-old fourth-year engineering student at the University of Western Australia, may have the solution to Intel's



On the glow: Hydzik found neon lighting improved airflow by 22%.

Prescott cooling woes... a case entirely constructed of case fans. Travis admits he's not sure whether the airflow is exactly right, with some fans drawing air in and others sucking it out. But despite a lack of empirical evidence, he suspects he's created a more efficient cooling system than Intel's new BTX thermal reference platform.

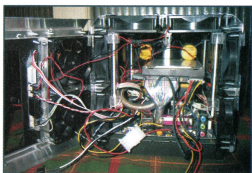
The solution may not be low-noise (more like a vacuum cleaner on full suck, according to Hydzik), and it does get "kinda annoying sitting next to you" because of the amount of air it blows out, but it's very cost-effective — Travis picked up a bulk lot of 20 fans from eBay for \$30. "Besides the mini-ITX parts, the construction costs were fairly small," he told APC. "Bunnings stocks all the parts you need."

Travis has also turned an old IBM ThinkPad 760E into a digital photo frame, and made a "PC in a matchbox" using a giant-sized replica of an original Redheads matchbox. His next project will be to take a Videosphere TV — a JVC television set from the

Extreme geek



Boombox: it plays music while you exercise and keeps your neck and shoulders dry too.



Wiring diagram: it sounded like such a good idea at the time.

'60s that looks like a space helmet — and hook it up to a PC. The practical purpose? Hydzik doesn't really care. To him, it's all about the challenge.

Dan Warne

Data dump

\$537,000,000

Income in US dollars generated by Apple iPods in the last quarter of 2004. Hong Kong company Pat-Rights wants 12% of it, and all previous iPod revenues, claiming that Apple has infringed its copyright on "Internet User Identity Verification".

Weight of Apple's new Mac mini desktop computer

1.32kg

Approximate number of quarterly Internet banking transactions by Australians

600 million

(Source: Gizmodo.com)

Growth in Australian PC market during 2004

22%

(Source: IDC)

Downloads of Firefox 1.0 during the 100 days after its release

25.24 million

(Source: Mozilla Foundation)

Weight of Sony VAIO VGNT17GP/S laptop

1.38kg

Approximate number of cheques processed quarterly by Australian banks

543.5 million

Largest PC company in Australia

HP with 17.1% market share

Firefox's current market share

4.8%

(Source: JupiterResearch, quoted by TechWeb News)

Why antivirus is a con

The person behind Norton AntiVirus wasn't Peter Norton... it was Peter Tippet, and he tells his story exclusively for APC.

You developed the product that became Norton AntiVirus (NAV). What do you think of it now?

It's human nature to sell people both what they want and what they need.

That's very cryptic.

The first version I produced stopped any virus that could be produced. "No updates required" was the tagline. It recorded the state of all the software on your system and anything new just wouldn't run, which counted out all malicious code. It won all kinds of awards. As an afterthought, we added a virus signature scanner and sold it to Symantec. It became NAV. But Symantec felt nobody could understand the generic new software-blocking stuff, so that feature quietly dropped away.

What happened next?

At Norton, we were looking for products to sell subscriptions off. We didn't realise we already had one! In those days, when people bought a program the updates came free.

So the bean counters won out.

If you sell people stuff a product that actually works without needing updates, someone's going to "improve" on your business model. Ultimately everyone—including us—went to scanning.

So have we all been led up the garden path?

There are new attacks 30 or 40 times a day. Why wouldn't you just block everything except the things you accept, rather than trying to target the bad things? The list of good things is finite,

the list of bad things is infinite and will be that way forever.

The company you work for now advises other companies on how to secure their networks. What advice can you give APC readers?

Despite the emphasis on updating more quickly and more frequently, once you get to weekly virus signature updates, you don't actually reduce the risk statistically. Companies should focus on stopping attacks at the network perimeter rather than wasting resources on patching more often than every six months.

Likewise, home users should use a router rather than connecting their PC directly to a modem. Routers deflect 80% of all incoming attacks from the Internet by default

Interview



— a natural benefit of their inbuilt Internet connection-sharing NAT firewall.

You're a consultant to the Joint Chiefs at the White House. What's worrying them at the moment?

The White House is trying to get at what will actually work to stop cyber-terrorism. It's about getting pragmatic stuff widely deployed. Lobby governments to lean on ISPs to filter traffic for home users. It's so silly for them to pass the Windows networking ports 137 and 139 from the Internet and argue they have no responsibility.

Peter Tippet is the chief technology officer of security consulting firm Cybertrust. He spoke to Dan Warr.

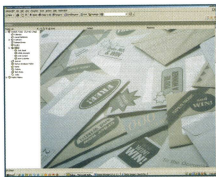
Spam act impotent

A year into Australia's Spam Act, the volume of junk continues to grow.

Before Australia's Spam Act came into effect last year, 40% of spam received by Australians originated here. That figure is now down to less than 2%. Yet spammers are creating workarounds to sidestep legislation as quickly as law-makers create it.

Many spammers have turned to posting "comment spam" on forum Web sites. Spammers are also sending email from unregistered domains, then registering them and establishing Web sites.

The Australian Communications Authority (ACA) is now working on a technical approach to resolve these challenges. Following a successful trial earlier this year, the ACA has commissioned a one-click spam reporting system. It's not yet clear how it will use the information gathered, or whether the



No junk mail: will the spam ever stop?

scheme will apply only to spam emanating from Australia.

Steve Darby from ISP iiNet doesn't believe the answer lies in legislation or software. He advocates better filtering by ISPs. This is much better, he said, than "trying to track them down after they've inflicted the damage".

Tim Gaden

Are you I33t enough for Microsoft?

1337 sk1llz
Noob

Microsoft has created a helpful online guide to hacker-speak for those who get a bit crotchety that they can't understand what the kids of today are saying. The page, at www.microsoft.com/athome/security/children/kidtalk.mspx, describes terms like "pwn" — a typo-deliberate version of own, a slang term meaning to dominate and can also be spelled "0V/Vn3d" or "pwn3d," among other variations. Online video game bullies, or "griefers", often use this term according to Microsoft.

Other useful words include "teh" (a deliberately subversive misspelling of "the"), and I33t (for "elite"). Useful as the page is, Microsoft could add a great deal of value by using some of the terms in context. For instance: "ph34r my I33t skillz, Windows XP SP2's memory protection has just been p/Vn3d!"

Quote file

"The toothpaste is out of the tube"

Paul Reynolds of UK telco BT, telling journalists that moves which don't quickly move to Internet protocol for everything will be left behind.



Steam, or just smoke and mirrors?

An over-ambitious online software distribution network is frustrating gamers to boiling point.

Game developer Valve is using its "Steam" system to distribute patches for popular titles such as Half-Life 2. Punters who order the game online must download the entire package at their own expense, including any excess download charges. Gamers who buy a boxed copy are able to install the game, but still need to connect to the Steam servers to authenticate the copy and launch Half-Life 2.

Login issues and overloaded servers are frustrating many of the 200,000 gamers connected to Steam at any given time. Edward Del Villar of Sutherland, NSW, told APC that Steam's automatic downloads had corrupted his entire game installation, forcing him to spend hours waiting for the files to reinstall from scratch.

Australian developers are monitoring the Steam situation closely. Strategic Studies Group (SSG) also offers direct digital distribution, and said the Steam system is impressively comprehensive but can be troublesome from a user perspective. "Customers get very irate when not allowed to play a product because the company's server has gone down," said SSG programmer Alex Shaw.

Steam's problems haven't dissuaded Telstra from starting its own online software distribution service. Its BigPond PlayNow service, launched



Hot and bothered: Valve's Steam distribution system has many users blowing gaskets.

in April, costs \$19.95 per month (or \$24.95 for customers of other ISPs) and allows users to download and play any of the 100 games on its servers. Telstra said it has ample capacity to handle the expected volume of traffic generated by the service.

The German Consumer Association recently found that Vivendi Universal, the publisher of Half-Life 2, had neglected to highlight how crucial it is to have an Internet connection on the packaging. Australian consumers who feel they have been scalded by Steam should consider complaining to their state's Office of Fair Trading.

Jeanne-Vida Douglas

DREAM SYSTEM

"Roger control, 13 CRTs approaching for landing"



Plane, not simple: so this is what Ferris does on his day off...

Flight sim buffs wouldn't blink twice at a PC rig running two or three screens for maximum panoramic views. But Steve Ferris wanted a 747 in his lounge room. Now, when he goes wheels-up, he gets a view of the world on 13 screens, using a networked array of nine PCs, three running XP and the remainder Windows 98.

"When you sit in front, all screens line up reasonably well," he says modestly. However, the 3,000 word tutorial on his Web site (<http://members.chello.nl/~s.ferris>) hints at the excruciating networking configuration pain you'd have to go through to match his setup.

Forum users were agog at Ferris' setup when it was outed on Slashdot (<http://slashdot.org>) recently, observing that his use of Windows 98 would add startling crash realism, while the sound of so many power supplies, CPUs, video and case fans running at once would accurately mimic the sound of a jet engine. Luckily, Ferris has a real-life, aviation-grade seatbelt and oxygen mask installed in case of virtual turbulence or crash landing.

Dan Warne

Vigor2500V - Security ADSL VoIP Router

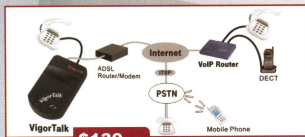
- ADSL router for sharing your Internet connection.
- Support SIP Protocol.
- 1 x Phone port compatible with any regular telephone.
- 1 x Line port for passthrough your regular PSTN phone line.
- Automatic failover to PSTN line during power cuts.
- Automatic QoS to reserve higher priority for VoIP Internet traffic.
- SPI Firewall & DDoS defense protected your Internet connection & PCs.
- 4 x LAN, 10/100 Auto MDI/MDIX.
- Internet URL Content Filtering & uPnP.
- Support VPN passthrough for VPN client or server.
- E-mail detection indicate in front panel LED.

\$349 RRP



VigorTalk - VoIP SIP ATA adaptor

- Small portable design - connects to any RJ45 Ethernet Internet connection (e.g. broadband router).
- Make regular voice calls over the internet using the latest Voice-over-IP (VoIP) technology with high quality, similar to a regular phone line.
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- Make and receive calls from / to regular phone lines and mobile phones, via PSTN gateways.



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- Compatible with Telstra ISDN (Vigor2600V & VGI only).
- Support SIP Protocol with 2 x FXS port for VoIP.
- Full QoS control allow Voice, Video, e-mail, HTTP, FTP, P2P and VPN stream in different priority.
- SPI Firewall, UPnP & DDoS protection.
- Up to 16 Full VPN connections with encryptions.
- USB Print Server for LPR printer.
- 802.11g compliant wireless LAN access with security features (Vigor2600VG & Vigor2600VGI only).

Vigor2600V: **\$399**
Vigor2600Vi: **\$499**
Vigor2600VG: **\$479**
Vigor2600VGI: **\$579**



Vigor2100V Series model: Vigor2100V / VG

- 1 x WAN port for broadband connection.
- Support SIP Protocol.
- 1 x Phone and 1 x Line port.
- Automatic failover to PSTN line during power cuts.
- Automatic QoS to reserve higher priority for VoIP traffic.
- SPI Firewall & DDoS defense protected your PCs.
- 4 x LAN, 10/100 Auto MDI/MDIX.
- Internet URL Content Filtering & uPnP.
- Support VPN passthrough for VPN client or server.
- 802.11g compliant wireless LAN access with security features (Vigor2100VG only).

Vigor2100V: **\$189**
Vigor2100VG: **\$259**



Vigor2900V Series model: V / VI / VG / VGI

- 1 x WAN port for broadband connection.
- Compatible with BigPond & Optus Cable.
- Compatible with Telstra ISDN (Vigor2900V & VGI only).
- Support SIP Protocol with 2 x FXS port for VoIP.
- Full QoS control allow Voice, Video, e-mail, HTTP, FTP, P2P and VPN stream in different priority.
- SPI Firewall, UPnP & DDoS protection.
- Up to 32 Full VPN connections with encryptions.
- USB Print Server for LPR printer.
- 802.11g compliant wireless LAN access with security features (Vigor2900VG & Vigor2900VGI only).

Vigor2900V: **\$339**
Vigor2900Vi: **\$439**
Vigor2900VG: **\$399**
Vigor2900VGI: **\$499**



	WAN Port (To Internet)			WLAN	VoIP Ports
	ADSL	Ethernet	ISDN	802.11g	
Vigor2100V	●			P.T	1
Vigor2100VG		●		P.T	1
Vigor2500V	●			P.T	1
Vigor2600Plus	●			16	
Vigor2600i	●	●		16	
Vigor2600G	●			16	●
Vigor2600Gi	●	●		16	●
Vigor2600Ge	●			16	●
Vigor2600V	●		●	16	2
Vigor2600VG	●		●	16	2
Vigor2600VGI	●	●	●	16	2
Vigor2900V	●			32	2
Vigor2900Vi	●	●		32	2
Vigor2900VG	●	●		32	2
Vigor2900VGI	●	●	●	32	2

E, Net = Ethernet P.T = Pass Through

Vigor2600Ge 54Mbps WLAN ADSL Router

- ADSL router for sharing your Internet connection.
- 4 x LAN, 10/100 Auto MDI/MDIX.
- Support Class-C network of up to 253 clients.
- SPI Firewall & DDoS defense protected your Internet connection & PCs.
- NAT Port redirection, forwarding and DMZ.
- Internet URL Content Filtering.
- Support Universal Plug'n'Play (uPnP).
- Up to 2 Full VPN connections with encryptions. (AU Only)
- 802.11g Compliant Wireless LAN access with security features.

\$199 RRP
inc. ADSL filter



Vigor2600Plus & Vigor2600G Series

model: Vigor2600Plus / I / G / GI

- ADSL router for sharing your Internet connection.
- Compatible with Telstra ISDN (Vigor2600i & GI only).
- USB Print Server for LPR printer.
- Full QoS control allow Voice, Video, e-mail, HTTP, FTP, P2P and VPN stream in different priority.
- SPI Firewall, UPnP & DDoS protection.
- Up to 16 Full VPN connections with encryptions.
- Internet Content Filtering, VLAN & Rate Control.
- 802.11g compliant wireless LAN access with security features (Vigor2600G & Vigor2600GI only).

Vigor2600Plus: **\$299**
Vigor2600G: **\$399**
Vigor2600GI: **\$349**
Vigor2600GII: **\$449**



DrayTek Australia

Sydney: (02) 9799 8887 FAX: (02) 9799 2475
We welcome Reseller and Dealer inquiries

1800 617 711

www.draytek.com.au
sales@draytek.com.au

TOP FIVE

VoIP tips

FAST ENOUGH?

VoIP requires a minimum 512/128Kbit/s broadband connection as some services use the full 64Kbit/s upstream bandwidth plus network overhead.

PRIORITY SERVICE

Quality of Service (QoS) prioritises VoIP over less time-sensitive data. If your ISP doesn't have QoS throughout its network, consider switching. Your modem must support it too.

MINIMISE MONTHLY FEES

Many plans are cheaper for outgoing calls only, and you can still receive incoming calls via your landline.

PACKAGE DEALS

Buying VoIP through your ISP may offer big savings. For instance, Internode gives all its broadband customers a pay-as-you-call service with no monthly fee.

WIRELESS VOIP

Multi-handset DECT digital cordless phones are ideal for multiple handsets on a VoIP line.

Glitch-free VoIP

Is sound quality being forgotten in the rush to move telephony to VoIP?

Dan Warne investigates.

Voice over Internet Protocol (VoIP) telephony is still in its "gold rush" stage in Australia. Small startup companies are desperately trying to build market share before all the eligible customers are snapped up.

The highest profile provider, Engin (<http://engin.com.au>), recently announced that it had signed its 4,000th customer. "It's a relatively modest number," managing director Ilkka Tales admits. "But then again, [US VoIP giant] Vonage only signed up that many in its first eight months of operation. Now it's putting on 60,000 customers a month."

Engin is well positioned to continue its growth, but faces the same challenge as other Australian VoIP providers — delivering a service that works consistently despite the hotchpotch of largely unconfigured network hardware found in home environments.

Early adopters of VoIP have found that when it works, it works well, with sound

quality at least as clear as a mobile phone call. But if another member of the household uses the Net connection heavily at the same time, VoIP calls start to glitch and drop out. That's a side effect of the VoIP data stream being overcome by other data such as P2P and large file downloads jostling for the available bandwidth on the broadband connection.

The problem is a lack of Quality of Service (QoS) controls in home router hardware and Australian broadband providers' networks (see APC March, page 91).

For tech-savvy computer users, QoS means the ability to finely configure the priority of data travelling in and out of a home broadband connection, providing optimum responsiveness in online gaming and Internet telephony. For Grandma, it simply means the difference between a "phone line" that works properly and one that doesn't.

WHOSE PROBLEM IS IT?

As more users test the VoIP waters, it has become obvious that many home routers simply don't have enough grunt to do QoS properly. "The problem is that a home router can only prioritise outgoing VoIP data being sent out onto the Internet," says Murray Wild, engineering manager at Thomson Australia, the supplier of ADSL modem/routers to Telstra BigPond. A provider needs to have QoS all the way through their network, from beginning to end, for incoming VoIP data to flow smoothly as well, Wild explains.

Although Telstra is implementing VoIP across its entire network (with an expected completion date of June), there is currently no QoS, so all data is given equal priority.

Feisty ISPs Internode and Netspace have jumped on the opportunity to one-up Telstra by introducing VoIP-friendly broadband services with QoS for consumers.

Internode already has QoS running throughout its national network, giving priority to VoIP data at all points.

Its sister company, Agile Communications, is installing DSLAMs into a selection of Telstra exchanges around the country in order to provide direct network connections to users'

Why you need VoIP



FREE VOIP TO VOIP

If you have friends and family interstate or overseas, the phone bills can really mount up.

Making a VoIP call is cheaper than using a conventional phone line, but if you call frequently, be sure to get a VoIP service on both ends. Most VoIP providers allow you to make free "on Net" calls — as long as you're calling another of their customers.



POOR MAN'S 1300 NUMBER

If you run a small business, you can rent a phone number in each state (\$5-\$10 per month per number) which will connect callers to your VoIP service. The incoming calls cost you nothing, and your customers only have to pay a local call cost. It's not quite a 1300 number because you still have to advertise a local number in each state, but it's much cheaper.



CUT THE UMBILICAL CORD

Consider running VoIP over wireless broadband or cable Internet.

Wireless ISP iBurst has coverage in metropolitan Sydney, Brisbane, the Gold Coast, Melbourne and Canberra, and there are plans to extend coverage to Wollongong, Newcastle, and the NSW Central Coast. BigPond or OptusNet Cable can also be used as VoIP "phone lines".



BALANCE COST AND QUALITY

Landline calls are still better quality than VoIP, and since most people need to keep their phone line connected for ADSL

anyway, why not use your landline for incoming calls and use VoIP only for outgoing? Newer VoIP adaptors can handle incoming through PSTN and outgoing through VoIP, all through one handset.



NO MORE PHONE SQUABBLES

With VoIP, you can run as many virtual phone lines and numbers at home as you like, as long as your Internet speed is fast enough to handle it. Internode offers

all its customers the option of two VoIP lines with no monthly fee. See page 27 for a comparison of network scenarios to help plan the best setup for you.



ROAM THE WORLD

You can plug in a VoIP adaptor anywhere in the world, and if someone calls your VoIP number, your phone will ring. If you're a regular traveller,

it's the "landline phone" that travels with you. And if you're living overseas, get an Australian VoIP number so your friends and family can call you at a local call rate, no matter where you are.

homes, thereby cutting Telstra's telephony network out of the loop entirely.

But Agile's direct exchange coverage is small: compared to Telstra's rollout of ADSL to around 1,300 exchanges, Agile will initially reach only 49 exchanges by the third quarter of this year. All other customers connected to Internode still use Telstra as the "last mile" provider into homes.

Netspace also runs QoS throughout its network but doesn't have its own DSLAMs, meaning that the quality of network traffic running directly into customers' homes is at Telstra's mercy. However, the company's managing director, Stuart Marburg, says all of Netspace's tech support has been done over VoIP for years, meaning its network is very finely tuned for QoS.

ACCOUNTING FOR QUALITY

The choice of software sound coder/decoder (codec) is as important as QoS in achieving glitch-free VoIP.

The telecommunications industry uses a scientific test called the "Mean Opinion Score" (MOS) to compare the sound quality of different codecs. To reach the score, a large panel of listeners judge the sound quality of

a voice sample and give it a rating from 1 (bad) to 5 (excellent). Scores are then averaged.

With higher quality sound often comes greater bandwidth usage. On Australia's upstream-strangled DSL connections, using best-quality codecs such as G.711 PCM won't meet with much success. The G.711 codec requires at least 64Kbit/s upstream speed, and 256/64Kbit/s ADSL connections won't be able to keep up. Even 512/128Kbit/s connections will have trouble if the Net connection is used for anything else at the same time.

The trade-off with lower bandwidth codecs is compression delays — as the data is "zipped" down in size, a fractional delay is introduced into the call. Anything longer than 25ms is noticeable.

You won't usually be able to choose which codec your provider uses for VoIP, but you can ask a provider which codecs they support and ensure that your hardware is compatible. The table below shows how networking company Cisco rates the sound quality of different codecs.

Codec sound quality and bandwidth compared

Codec	Sound quality (MOS)	Kbit/s up/down	Compression delay (ms)
Landline phone	4.2	N/A	N/A
G.711	4.1	64	0.75
G.729	3.92	8	10
G.723.1 MP-LAQ	3.9	6.3	30
G.726	3.85	32	1
G.729a	3.7	8	10
G.723.1 ACELP	3.65	5.3	30
G.728	3.61	16	3
Good mobile call	3.6	N/A	N/A

Source: Cisco

Cut your desk spaghetti

If your desk is cluttered with cables, it's likely you're an early adopter of broadband. For many people, the mess started with a plain ADSL modem, then turned into a nightmare with the addition of a router.

For most people, adding a wireless access point did anything but cut down on the cords, and incorporating a VoIP analog telephone adaptor or an IP phone only contributes to the problem. Fortunately, a number of the major networking vendors have introduced all-in-one boxes to the market.

ZyXEL's new P-2602HWL (\$349, distributed by www.bluechipit.com.au) includes an ADSL2/2+ capable modem, 802.11g wireless access point, broadband router, four-port 10/100 network switch and dual-port VoIP analog telephone adaptor. It also has two analog phone ports, allowing two calls to be made or received simultaneously via VoIP, or one call via VoIP and one call via the public phone network.

The main attraction of an all-in-one unit is "PSTN-passthrough" and "lifelike telephony". Although the most expensive standalone analog telephone adaptors can also do this, it's infinitely simpler if you have everything built into one box. PSTN-passthrough uses your regular Telstra phone number for incoming calls, while all outgoing calls are made via VoIP at ultra-cheap rates.

Lifelike telephony means if your Internet connection dies or there's a power outage, all

phone calls (both incoming and outgoing) drop back to your Telstra landline.

You can also save money with these features. Since you don't need to rent an additional phone number on the public telephone network to be linked to your VoIP service, many ISPs will offer VoIP packaged with their broadband services.

Internode's Simon Hackett explains: "You're already paying Telstra for a phone number as part of the line rental, so on our VoIP service, you get to keep your existing home/office number for incoming calls. Then, since you're making all outgoing calls via VoIP, switch your home phone plan onto the \$18.50 Telstra Homeline Budget line rental.

"If you consider that getting a landline phone number linked to a VoIP service costs \$10 per month from most VoIP providers — including Internode — in real terms, it's only costing you \$8.50 per month as 'line rental' for your home phone line."

Other network hardware manufacturers have signalled their intentions to introduce similar models in coming months. Linksys (www.linksys.com.au) says its WAG54GP2 offers similar functionality to the ZyXEL and will cost \$299, but full specs weren't available for comparison at the time of writing.

Some industry players don't believe that the cheapest all-in-ones are the way to go. "What you'll find within the next six months is that more ISPs and telcos will move towards



Clutter: Internode marketing director Simon Hackett loved his home networking gadgets, until one day...



Unclutter:... his wife replaced the lot with a ZyXEL P-2602HWL.

installing proper residential gateways," says Allied Telesys's managing director, Mark Jackson. "Pricing is coming down to be comparable with DSL modem/routers, but home gateways have really solid QoS built in to stream multiple services one broadband line into the home.

"The large networking vendors are racing to support proper 'double-play' — broadband Internet and voice," Jackson continues. "But it won't be long till ISPs want to offer video over ADSL as well, and they'll soon find that a lot of the cheap hardware doesn't have enough QoS power to provide that at high quality."

VoIP on a budget



VoIP router

If you only have a plain ADSL modem at the moment (with no Internet connection sharing capability), Netgear's WGR615V is good buy (www.netgear.com.au). It offers an Internet connection sharing NAT router, dual-port VoIP adaptor and 802.11g wireless access point in one.

IP phone

The Grandstream Budgetone 101 phone from OzVoIP.com (<http://ozvoip.com>) is a VoIP telephone handset that plugs straight into your broadband router. People Telecom (www.peopletelecom.com.au) offers a similar handset to broadband customers for \$5.50 per month on a 12-month contract.

Analog adaptor

An analog telephone adaptor is all you need to get going with VoIP. The Netcomm V100 (www.netcomm.com.au) is keenly priced and Engin's VoiceBox (www.engin.com.au) is popular, but unlike the Netcomm you can't change providers because the settings are locked in.

The soft option

There are many free software apps available for making VoIP calls, like X-Lite (pictured) and SIPPhone. Providers like SIPPhone (<http://sipphone.com>) offer preconfigured versions. Use an existing microphone and headphones, or buy a cheap all-in-one headset for the call centre effect.

VoIP providers compared

Deciding which VoIP provider is right for you depends on your priorities. Frequent STD callers should consider the "intercapital" rates. This is where call charges are capped between major capital cities and regional areas where a provider has a "point of presence".

A point of presence is an area where the VoIP provider's server physically connects calls to the local telephone network. Outside these areas, the provider must pay a telco to connect the calls, so rates are usually higher. Providers such as Nella Telecommunications'

SmartVoice (www.nella.net.au) specialise in broad regional area coverage. The trade-off is less generous intercapital rates.

For overseas calls, the rates are incredible. SmartVoice, for instance, offers 1 cent per minute to Canada, Hong Kong, New Zealand, China, the US, the UK and more.

Don't forget to factor in such things as fees and the cost of hardware. People Telecom (www.peopletelcom.com.au) provides a free IP phone if you sign up for a 12-month contract on its \$5.50 per month plan. On

the other hand, buying your own hardware ensures that you don't end up with a box locked to a single provider. Commitment-phobes should consider a service with no monthly fees.

With MyNetFone (www.myfone.com.au), you can use a PC or SIP phone/ATA to call regular telephone numbers via VoIP. However, no incoming phone number is provided for the service. Internode (www.internode.on.net) offers a similar deal to its broadband customers. **IT16**

How cheap are the deals?

Provider	Signup fee	Monthly fee	On-net calls	Intercapital calls	National calls	Mobile calls	PSTN phone number	Extra PSTN numbers
AstraTel (\$29.95 plan) www.astralat.com.au	\$29*	\$29.95 (includes 200 landline calls) ¹	Free	10 cents untimed	10 cents untimed	29.9c per min***	Included	TBA
ATP www.atp.org.au	Free*	\$0	Free	22 cents untimed	13.2 cents per min	31.9 cents per min	\$11 - first number	\$2.20
BroadbandPhone (\$15.95 plan) www.broadbandphone.com.au	Free*	\$15.95 (including 50 local calls)	Free	15 cents untimed	10 cents per min	30 cents per min	\$15.95 - first number (includes 50 local calls)	\$5.95
Engin (\$19.95 plan) www.engin.com.au	\$149, includes ATA	\$19.95	Free	10 cents untimed	10 cents per min	30 cents per min	Included in plans above \$19.95 per month	\$5 per month
FreshTel www.freshTel.net	Free*	Free	Free	6.9 cents per min	6.9 cents per min	30 cents per min	Not available	Not available
Internode www.internode.on.net	Free*	\$0*	Free	25 cents for 3 hours	10 cents per min, \$1.95 for 3 hours	30 cents per minute	\$10 per month	\$10 per month
MyNetFone (Megasaver plan) www.myfone.com.au	Free*	\$15	Free	10 cents per min (\$1.50 per 100 mins)	10 cents per min	(\$1.50 per 100 mins)	29 cents per min	Included
Spantalk (Span20 plan) www.spantalk.com.au	Free*	\$20	Free	4 cents per min	5 cents per min	28.4 cents per min	Not available	Not available
SmartVoice (Basic plan) www.smartvoice.com.au	Free*	\$9.90	Free	15 cents per 10 mins	5 cents per min	30 cents per min	Included	Not available
People Telecom People iPhone www.peopletelcom.com.au	Free*	\$5.50 (includes IP phone)**	Free	12 cents per min	12 cents per min	30 cents per min	Included	Not available

* Must be an existing broadband customer (\$10 per month for non-customers). ** 12-month contract. *** Billed in 30-second increments. ^ Bring your own SIP compatible hardware, or buy a phone or ATA from the provider. Most providers offer multiple plans with varied call rates. Consider this table an indicative guide, but please check directly with providers to get detailed pricing information before committing to purchase. Flagfall charges may apply on top of the per minute rates listed above. ¹ Landline calls within Australia, USA, UK, Canada and 10 countries in Western Europe)

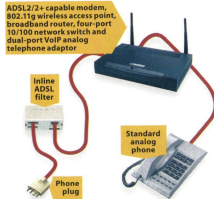
Network scenarios

Analog telephone adaptor



Tangle: what you gain in modular flexibility you lose in desk spaghetti.

All-in-one



Nirvana: if you can afford it, an all-in-one box is the neatest way of doing VoIP.

IP phone



The bells, the bells: IP phones allow you to put VoIP handsets in every room, each with its own "line".

Bagging a bargain (without getting burnt)



Few industries are as price-sensitive as computing. But be warned, cheap goods aren't always value for money according to *Jeanne-Vida Douglas*.

When it comes to chasing PC bargains, Ren Koh from Blackwood, South Australia is a veteran. But it hasn't always been easy.

In late 2004, he ordered an MSI video card through a Queensland-based online store. "I paid \$790 for the card, then saw it listed elsewhere for \$740," says Koh. "And when it got here, [it] had problems." Fortunately, the manufacturer replaced the card without too much hassle.

However, Koh's brush with a second online PC retailer was less positive. After searching for the lowest price, he bought an AMD CPU and some other components. "The picture on the site was of the retail product, but they sent me the OEM CPU," Koh says. "And they just threw it in the box with a heatsink and other components." The CPU didn't survive, and Koh spent weeks trying to sort things out via phone and email.

Koh's experience is not uncommon according to Andre Davidovic, who oversees an ongoing discussion thread at Whirlpool.net.au (<http://forums.whirlpool.net.au/forum-replies.cfm?t=131657>) which rates Australian PC outlets based on users' feedback. "If you're an IT novice, it's best to pay that little bit extra and use a store which values customer service over price," Davidovic advises. "On the other hand, if you know exactly what you want, you're usually pretty safe at the cheaper end of the market."

Having sorted through over 4,000 posts on the subject, Davidovic says most problems are caused by poor communication. "Small issues escalate, especially if a buyer is purchasing online for the first time."

THE OEM FACTOR

Like many who work in the tech sector, games developer Alex Shaw of Marrickville, NSW, is often asked to source computer systems and components for friends. Shaw generally builds his own boxes for gaming, and usually

In search of the best deal: local price search engines to the rescue



www.razorprices.com

"I set up the site in early 2001. There was a handful of sites at the time that tried to help users find good prices for hardware, but these were all manually updated and constantly out-of-date. I decided to create a new site to automatically keep track of hardware prices from a large number of online retailers."

David Rugendyke, owner-operator of Razor Prices.



www.staticice.com.au

"I've been in the computing industry for 13 years, so I know it pays to shop around. One day, while searching around for prices, I stumbled across some Australian computer hardware price search engines. The first thought that came to mind was to do away with my tedious manual text files and build a bigger and better site than the existing Australian price search engines."

Eric Lam, founder of staticICE.



www.shopbot.com.au

"We retrieve online sellers' prices to simplify our readers' purchases. Buying the cheapest is often an excellent idea, but not always. It's difficult to have the best service with the lowest price — the buyer has to check that the product is in stock if they want to receive it quickly. Check forums for opinions and try to join the shop by mail or by phone."

Ethan Ropper, founder of ShopBot.

Shopping list

How much can you save by shopping around? Often the saving is hundreds of dollars on larger items, but don't count your savings until the part is delivered, installed and running. And while price search engines may locate the cheapest available part, they don't always rate availability, service, support or warranties.

While chasing the cheapest is tempting, it isn't necessarily the best way to save money. It's generally more effective to try and find a balance between service and price, then stick with one or two resellers rather than chopping and changing.

	Staticice.com.au	Harris Technology	Overseas plus shipping or mail forwarding fee
Western Digital 200GB hard drive, WD2000BB	\$149.50 plus \$9-\$15 delivery from Digispan Technologies	\$210 plus \$7 delivery	US\$106 plus US\$28-\$95 freight forwarding www.zlpcosmfly.com
Sony 16x Double Layer DVD drive, OEM DW-022A	\$118 (no delivery charge provided) from Computer Supermarket	\$165 plus \$7 delivery	US\$63 plus US\$28-\$95 freight forwarding www.directron.com
Samsung 17in LCD monitor, 172X	\$645 plus \$25-\$30 delivery from PC Quest	\$725 plus \$9-\$17 delivery	US\$308 plus US\$76-\$225 freight forwarding www.amazon.com
Kingston 512MB RAM, PC3200	\$129.50 plus \$8.50-\$14 delivery from Nintex	\$209 plus \$7 delivery	US\$79 plus US\$28-\$95 freight forwarding www.tigerdirect.com
Shintaro 8X DVD-R 50 spindle	\$45 plus \$10-\$13 delivery from Programmers Paradise	\$53 plus \$9-\$13 delivery	Australian-based product
Logitech MX1000 optical laser mouse	\$111.20 plus \$6.60-\$11 from ECom Computers	\$145 plus \$7 delivery	US\$45.95 plus \$41-\$175 freight forwarding www.compuplus.com
Microsoft Office 2003 Professional	\$412 for OEM version (\$1,580 for qualifying system) plus \$9-\$14.50 delivery from Macrotechnology	\$799 full retail version plus \$7 delivery	US\$338.99 for OEM version plus US\$989 for qualifying hardware plus US\$76-\$250 freight forwarding
Warranty support?	Don't throw out the packaging and don't remove any stickers or you might void the warranty. Check online forums for information and feedback on specific resellers	Likely to have replacement products in stock. Returns policy varies depending on product - details on Web site (www.ht.com.au/returns).	Make sure you check out warranty provisions before you send your credit card details, and don't throw out the packaging.

sources OEM parts for systems from Web sites such as EYO (www.eyo.com.au) when buying for others, simply because they're cheaper than boxed retail equivalents.

He reckons you can save "about 50%" by shopping around. However, Shaw warns against the mentality that cheapest equals best. He also recommends contacting the company to ensure advertised retail products are not substituted with OEM equivalents.

But if the service is good, Shaw believes that OEM systems and parts offer great value for money. OEM components may not be as flash as their branded counterparts, but often do the same job at a fraction of the price.

OEM software can also be a good option when purchasing a new system, but while retail versions can be transferred between machines, OEM versions may be tied to a single system and its activation can even be voided by upgrades. It often needs to be installed by specific partners, and although it is possible to buy OEM apps from overseas, you'll be in breach of the licence agreement if

you import and install them. For instance, OEM versions of Microsoft Office cost half the price of the retail version, but only with new systems from certified Microsoft partners.

"The OEM licence lives with that computer," confirms Office product manager for Microsoft Australia, Tony Wilkinson. "It usually comes preinstalled. The CDs are sometimes included so you can reinstall it on the same machine if you need to, but you can't transfer the licence to a new PC, or to an upgraded machine with a new motherboard installed."

THE OVERSEAS OPTION

Since the advent of local

price search engines (see "In search of the best deal"), bargain hunters no longer need to consider international options. However, some deals simply can't be found locally. For instance, an Apple PowerBook G4 adaptor costs \$129 from Apple Australia, but a compatible third party power adaptor from MacSales (www.macsales.com) is US\$34.95.

It's a good example of a purchase where the savings aren't immediately lost on freight and insurance charges. But if you're going to

spend more than \$1,000 on goods imported through the postal system, or \$250 on goods brought in by air or sea cargo, brace yourself for additional customs charges and GST.

If a foreign reseller has affordable shipping arrangements in place, offers international warranties or has components that aren't available locally, buying offshore may be worthwhile, especially for small, light items like RAM, which can often be bought overseas at a considerable saving.

Whirlpool's Davidovic says he'd order smaller parts and items unavailable locally from foreign Web sites. "However, I strongly recommend purchasing parts in Australia, unless the savings are very substantial and you're willing to take the risk."

IT SHOPPING CHECKLIST

Before diving in, do your homework. Visit online forums like Whirlpool and Overclockers (www.overclockers.com.au) and check for feedback. Don't assume a flashy site reflects high service standards; take freight and shipping charges into account when comparing prices; and beware of resellers who rely on one or two heavily discounted products to hook in new trade. **ETITB**

**Before entering
credit card details,
do your homework**

In the domain of thieves

It sounds like a nightmare, but one reader really did wake up one morning to discover that her domain had been stolen overnight.

Dear Watchdog,

I came across your article "Dude, where's my domain?" (APC March, page 18). My husband and I own — or owned until recently — NationalDirectory.com. It is a small, clean search engine we started in 1997. It has no adult content, little advertising and no pop-ups. We have several million pages indexed.

When we went to work on it last Friday, it was gone. Some company in Korea had taken it over. Register.com, with whom we have our other 25 domains registered, has been slow to react to our phone calls and emails. We also contacted the global Internet domain name authority ICANN, and everyone is waiting for the Korean registrar that put the transfer through, Dotforce.com, to respond with the "form of authorisation" proof.

My husband and I are just devastated. We operate several other sites and have now had to put domain transfer locks on all of them.

This is one of those stories you hear about but never think will happen to you.

ICANN's new policy seems to be wipe its hands of responsibility and let people get away with domain theft. One simple email is sent to the registrar and if there is no response in five days, the domain transfer goes through. We never even received that warning email, never mind the other information available for contact such as physical address, phone numbers, or the contact information on the other 25 domains we have. They said they sent an email to an address that was neither valid, nor even our email address.

The site has had [several] different faces since we lost control of it. Most recently it points to a search site that is registered to a company in the Cayman Islands. Help!

Tamara Shirazi
NationalDirectory.com
San Diego, CA, USA



It's a croc: Web sites can turn up in the oddest places.

Watchdog immediately contacted ICANN and asked it how the domain had been fraudulently transferred. A US-based spokesperson said it would have to wait for the Korean registrar DotForce.com to respond within five days. He said language issues had posed difficulties for ICANN in reaching DotForce.com on the phone.

After the five-day period expired, Tamara Shirazi let us know that ICANN had found the transfer to be fraudulent, and NationalDirectory.com had been returned to her control. But she said, "I am still horrified at how easy it was for this to happen. From what I've learned, this happens a lot more than it should. Fines should be imposed for such improprieties."

Ding dongs at Dell

Dear Watchdog,

I'd like to warn you and your readers about having anything to do with Dell Computers.

Last March, I ordered a Dell computer online and about 10 days later received a telephone call to tell me that it would be delivered on 30 March, 2004, between 1 and 5pm.

It wasn't delivered, so I tried Dell's 1800 number. After waiting, I gave up and sent an email cancelling the order and telling them to refund my money.

I tried checking online but kept getting messages that the session had expired — all within 15 seconds of accessing Dell's Web site.

After a week, the money had not been refunded so I sent another

email. Again there was no response so I phoned the number on the invoice and got through to someone in an overseas call centre. I explained the situation and was promised that the money would be repaid immediately. A week went by and still no refund.

I phoned again and only after having stern words with the call centre manager did I get a refund. But of course they wouldn't pay me interest on my money.

Since then, I have received an endless stream of email and snail mail offers from Dell. I have written to them — both by email and post — asking to be removed from their mailing list. Of course they haven't taken any notice of these requests, which have turned into demands with the passage of time.

I would like to warn APC readers that if they give their details to Dell online they will be bombarded by an endless stream of junk mail — both email and in their letterbox.

Charlie Wat
Moonie Ponds, Vic

Dear Watchdog,

Dell's goal is to provide customers with the best service in the industry and we realise that involves not just a good price on a product but also delivering it on time.

Dell systems are built to order. By using the My Order Status feature on www.dell.com.au our customers can track their purchase from order to delivery, typically within seven to 10 working days.

But sometimes, with the best intentions, we fall short of that goal. When an order is cancelled, we typically refund the payment within a few weeks and we regret any delay in Mr Wat's case.

Anyone receiving unwanted advertising material from Dell can remove themselves (from the mailing list) online at www.dellmail.info/subcentre/au or by calling Dell on 1800 812 393. We regret this wasn't followed through for Mr Wat and apologise for the inconvenience.

Paul McKeon
corporate affairs manager
Dell Australia



If the hat fits: no wonder they can't hear the phone.

"How are we going to recoup our lost revenues and traffic statistics?" she continued. "There's also the issue of damage to our Web site's reputation through the unauthorised use of our domain for any number of illegal or unethical purposes."

Watchdog asked ICANN if its new "automatic" domain transfer processes had adequate checks and balances to prevent domains being stolen. US spokesperson Kieran Baker defended the policy by saying it was no easier now to steal a domain than previously, and that any organisation could fall victim to fraud.

Baker asserted that the new process had overwhelmingly positive benefits, including greater ease of transfer, resulting in increased competition amongst registrars; provisions in contracts with registrars for enforcement of policies; and standard processes for resolving disputes.

Watchdog asked what punitive action would be taken against Korean registrar DotForce.com for failing to pick up the fraudulent transfer, but did not receive a response by press time. Tamara Shirazi is considering sending a bill to DotForce.com for lost revenue.

APPLE PLAYS HARBALL

I'm writing in response to "Curse of the spotty Apple" (APC March, page 28). After years of using a PC, I decided to jump ship and move to Mac at Christmas. After spending over \$3,000, imagine my disappointment after four weeks when an angry red dot appeared in the middle of the 20in iMac screen.

Upon contacting Apple support, I was told that one dead pixel did not warrant their attention. One dead pixel became more, and my screen started getting them all over.

As with Mr Wayne, I had a terrible time trying to get service. On logging the fault, I was told to take the unit to my nearest Apple Centre — 100km away. I asked about getting an onsite technician and was told the only way that this was going to happen was to take out the optional AppleCare plan (\$299).

Reluctantly, I bought the plan, logged my request and thought everything would be sorted out. Four days later, I hadn't heard anything, so I called again. No record of my call. I went through the whole arduous process again, describing the problem and was told a technician would contact me.

After two days, one did and advised that he'd be over for four days with a new screen for my iMac. But the day before, I got another call saying they hadn't received the part from

Pair gain a total pain

When Vic Stevens of Kelmescott, WA, read about the trouble Best Bookies had getting ADSL connected on a line that was just metres away from one that was already hooked up to broadband (Watchdog, APC February, page 29), he realised he wasn't alone.

"It seems crazy that my next-door neighbour and most of my street of 10 homes built in the last seven years have ADSL, yet I cannot get it," he told Watchdog. "The answer I get from Telstra is that we are too far from the exchange... about 9km."

Telstra's national media spokesman Rod Bruem told Watchdog: "We sympathise with Mr Stevens, especially since his ISP (iPrimus) reportedly fobbed him off, telling him to call Telstra direct rather than taking up his case with Telstra's wholesale arm."

"Whether Mr Stevens stays with his current ISP or switches with Telstra makes no difference to his predicament. Customers who are 9km from an exchange unfortunately cannot get ADSL. We'd like to help, but the problem is that the capacity for copper lines to transmit data diminishes over distance, and homes that far from exchanges cannot offer users a reliable, high quality service."

However, when Watchdog pressed Telstra on the inconsistencies between Stevens' neighbours' broadband coverage and his inability to get it, Bruem snapped back. He wrote, in part: "We investigate at

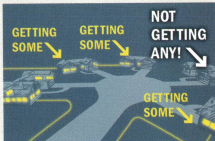
Apple and it would be another week. It's now been two weeks and I still sit here typing this email with Mr Spotty staring at me. Perhaps I should look at the spotless \$299 cardboard box that is my AppleCare plan instead.

Apple's so-called "within spec" policy is reprehensible. If you pay \$3,000 for a computer, it should work flawlessly. For heaven's sake, you can pick up a Samsung LCD monitor at any bargain-basement PC store and get a zero pixel guarantee, with next-day onsite swap over warranty!

Steve Rolfe
Narrandera, NSW

Apple Computer Australia's head of public relations, Martha Raupp, responded, in part: "I've alerted customer relations about this issue. As for an official response, I decline to comment. Thanks!"

Rolfe told Watchdog he was



Computer says no: it seems that not all phone subscribers are created equal.

iPrimus' request, not their customer directly or APC for that matter."

Watchdog asked Stevens' ISP, iPrimus, to take it further with Telstra. A proper investigation showed that the information Telstra had provided Stevens, iPrimus and APC was wrong. Stevens wasn't 9km from his exchange at all. The real problem was that his phone line was on an ADSL-incompatible pair gain unit, which effectively squeezes two or more phone lines down one copper phone line using digital encoding at both ends.

After some weeks of negotiation with Telstra, iPrimus was successful at getting the pair gain unit removed from Stevens' phone line and a dedicated phone line was installed. Stevens is now pleased to be connected to ADSL, but frustrated that it took this long to learn the truth about what was really preventing him from getting it.

surprised at Apple's refusal to deal with APC. His display was finally replaced by an Apple technician more than a month after he initially filed the fault report. "I imagine it was only due to the countless complaints I made," he said.

Have you experienced similar treatment by Apple? Are you an Apple reseller that has had to wait a long time for parts? Email us at watchdog@apcmag.com.

Contact us

WE WANT TO KNOW

how IT companies are really treating you. Letters must be under 500 words and include your full contact details and any product information. Write to: watchdog@apcmag.com or PO Box 4088, Sydney NSW 2001. All correspondence becomes the property of APC and is subject to editing.



Mac gets the message, we get the mini

Justin Kranz has mocked Apple and its Macs for many moons. Now he's tempted to buy one.

"Just don't tell your girlfriend," advises the smirking AppleCentre staffer as I wonder aloud about spending \$800 on a computer I really don't need — the Mac mini (see review, page 42). Like many, I've been a bit of a switcher. But those days, like Apple's descent into being known as "the iPod guys (who also make computers)", are over.

My salesman chum has every right to feel a little smug. After years of having sand kicked in his face by punters pointing out the bleedingly obvious price differential between Mac and PC, somebody at Cupertino has finally graduated from Retail 101. At a starting price of \$799 (including OS X "Panther"), the Mac mini may be cut-price, but it's not cut-performance. Don't bet against it selling by the tonne.

Who will buy it? PC users. If you're already a Macolyte, you probably use a machine that beats the mini's spec. But if you're a keen PC modder, or perhaps rolling out a small business network, or simply looking for a no-fuss home machine that's exceptionally good at digital media tasks, the mini represents a cheap, attractive and unobtrusive unit priced to be a viable alternative to a Windows/PC setup. And its OS offers a lot of what Longhorn is promising in the hazy future, without being prey to all the Trojans and viruses that plague Windows users.

Apple honchos downplay using the Mac mini as a living room media centre-style hub, preferring to focus on the Mac's famed idiot-proof music, Internet and photo capabilities. But they must be secretly delighted with the flood of "I modded my mini" and "make your mini a PVR" Web sites springing up. The thing practically begs to be messed with. And there's a massive difference between prying open the \$800 mini's case and doing the same thing on a \$2K+ desktop. The cost of replacement if you nuke it, for one thing, and your pulse rate mid-operation for another.

The main hardware compromises made for the price — a solitary memory slot with 256MB RAM and the sluggish 4,200rpm hard drive — are fixable. The 3D graphics

capability may only be a little faster than a well-lubricated abacus, but that doesn't impact on typical desktop app usage. To put things into perspective, the wallet-slaughtering 3D cards that feature in top-end workstations or gaming boxes cost as much, if not more, than the entire mini.

Moves like the mini make the folks at Microsoft lose sleep

As long as Apple doesn't regard the exercise as a one-off, the mini could well represent the turning point in the company's computing fortunes. Short of putting OS X out on x86 platforms, there isn't a more drastic move it could have made. PC manufacturers realised a long time ago that people who buy cheap

computers don't always continue to do so. They upgrade. Apple knows this too. The more traction you have down at the low end of the market, the more software developers will work on your platform.

There's a lot to like about Apple's new strategy. Moves like the mini make the folks at Microsoft lose sleep, so you have to love Steve Jobs for that. It's no good having a great OS and hardware combo if only 5% of the market uses it. Apple is rectifying its unfortunate reputation for making awesome computers at prices few can afford. For the sake of healthy competition and innovation, let's all hope Apple capitalises on its momentum. *Justin Kranz is an editor for Mammoth Media, an online community consultancy.*

Will Firefox outfox Internet Explorer?



The battle of the browsers
hots up as savvy users demand more.

The bad news for Internet Explorer continues to mount. More attacks. More security flaws. And more defections to Mozilla's Firefox. Is the IE team concerned? It's hard to tell — either they've been keeping their best poker faces or they don't feel at all threatened by Firefox. Dean Hachamovitch and his merry band of IE developers (who are actually part of the Windows team, mind), seem oblivious to, if not incredulous of, Firefox's momentum.

Having watched Microsoft zip from zero market share to eclipse the former browser kingpin Netscape Communications Corp., you'd think the Softies would have a little more fear and respect for the underdog.

Internet Explorer definitely continues to dominate (or, dare we say, "monopolise") the Web browser space, with more than 90% market share according to some analysts. But by the end of 2004, Firefox's share climbed to 4.06% — a 34% gain from early November to early December alone, according to market watchers at WebSideStory.

Though Microsoft officials have backed down on their hard line that there won't be a new standalone version of IE until Longhorn, it's unlikely Microsoft will pour all the new

features it must have up its sleeve into an interim release. Windows XP SP2 users might get a security-hardened "Internet Explorer 7", but Longhorn users will probably get something like "7.5", with more user interface improvements beyond desperately needed basics like tabbed browsing.

If you want anything like tabbed browsing or other Firefox-like features for IE before 2006, it's still uncertain how and if Microsoft will deliver. Your best bet right now is to look to one of the handful of browsers based on the IE rendering engine, such as Maxthon, Avant or InnerX, though each of these have their own unique downsides.

When you couple Microsoft's inflexibility with its growing emphasis on smart (in other words, fat) PC-based clients — as opposed to Web-based clients — you get the feeling that the Redmondians are feeling pretty unassailable right now.

Firefox hasn't won... yet. But Microsoft is losing credibility and risking a considerable amount of market share, simply by clinging to the artificial notion created by its top brass almost a decade ago that browsers are inseparable elements of operating systems. *Mary Jo Foley is the editor of Microsoft Watch (www.microsoft-watch.com). She sounds off exclusively for APC on Windows each month.*



Mary Jo Foley

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The Broadband Phone Company

APC sucked in by its own hype?

Some readers feel the Voice over IP application Skype was unfairly criticised in a previous issue of APC.

Dan Warne's Opinion on Skype (APC March, page 26) was a more than a little surprising to me. I think he needs to take a chill pill!

Why is he so negative about it? Granted, it may be a single vendor solution, but if you get a SIP [Session Initiation Protocol] phone at a subsidised price, you generally sign a service contract with the provider too. Don't you?

The point about "waving goodbye" to your credits if you don't use them is spurious. There is no need to buy more than 10 credit at any one time (approximately \$16.50). This amount is hardly going to break the bank. Why wouldn't you just use any outstanding credit anyway?

Regarding Warne's assertion that lack of competition might lead to higher call rates — just look at Skype's prices. To many places they're 0.021 (approximately 3.5 cents) per minute.

I have a friend who has a SIP phone and also uses Skype. He tells me the audio quality is as good and often better than SIP, particularly Skype to Skype.

The only negative of Skype I see from a user perspective is that people can't call a

Skype user from a normal phone because it doesn't provide direct inward dialling numbers in Australia yet. I can live with that for other benefits like Outlook phone book integration.

I say more power to Skype. It doesn't matter to me if it isn't "open".

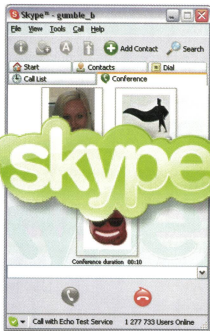
Mark McLaughlin
Oatlands, NSW

LIKE FIREFLY, BUT MORE POPULAR

Dan Warne creates the impression Skype is a poor product. The fact that free calls can only be made between Skype users is hardly a big negative considering the software is free, intuitive to use and easy to set up. In contrast, setting up a SIP service can be complicated.

Warne's article was not prepared to identify an alternative product that matched the benefits of Skype and addressed the negatives. In fact, APC recommended Firefly in November 2004 (page 100), which operates in the same way as Skype, only without the enormous public endorsement!

I think APC owes it to its readers to present a more balanced view of this product, and to



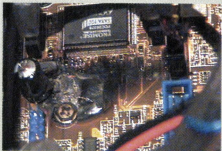
ask yourselves why it is number one in VoIP.

Chris Macfarlane
Little River, VIC

Dan Warne responds: SIP phones that are locked to a single provider are as bad as Skype, but fortunately the Australian VoIP

Burning question

I was intrigued to read Mat Ward's letter, (Watchdog, APC March, page 29) where the universal assumption was that the power spike that caused damage to the motherboard came from outside.



Melting moments: external power spikes aren't always to blame when boards (and customers) get burned.

With thin tracks, multi-layered boards and etching tolerances, it's not at all inconceivable that a power/earth track internally broke down, further heated the surrounding area and caused an avalanche (power spike), resulting in exactly the situation shown in the photograph. In most cases, tracks simply fuse and go open circuit. But occasionally the tracks bend with heat generated by use to cause the catastrophic contact you have here.

Did Warranty Assist Australia replace the board out of "goodwill"? No! More like common sense to realise that even after factory testing to weed out the worst motherboards, some get through — and I think this was one. It's sad that APC's industry muscle had to be used to address the issue, and even sadder that the

warranty apparently assumes no internal fault issues such as internal power surge.

External power surges usually leave charcoal everywhere, bubbled wiring insulation and exploded components!

Malcolm Moore
Turramurra, NSW

Malcolm's well argued letter wins him our regular prize of a Logitech LX 700 cordless keyboard and mouse set, valued at \$199.95.



Association is working on industry rules to stop this practice. Is there anything good about Skype cancelling credits on accounts that haven't been used for a while? How does this benefit the consumer?

Firefly actually allows SIP access to its network; Skype doesn't. And being number one in a product category doesn't intrinsically make it the best. It may simply mean the makers of Skype have been very successful with "viral marketing" and bundling distribution with Kazaa.

Skype call rates may be cheap now, but if it wins an Internet Explorer-like market share and SIP dies away as a viable standard, what incentive does Skype have to keep rates low? Market forces dictate that businesses charge whatever the market will sustain. Less competition ultimately results in higher prices.

SPAM SOLUTIONS

With all due respect to Peter Williams (APC March, page 31), there is indeed an issue with reporting spam to the police. Peter should have pointed out that spam needs to be reported on a sensible basis. For example, a system I designed for the company I work for filters over a million spam messages a month — up to 85% of our incoming mail.

Where Peter seems to have lost the plot is that without filtration, spam will inundate anyone's email system. Since most spam comes from offshore sources, it's not covered by Australian law and reporting to police that someone in Istanbul sent you a Viagra ad won't do anyone any good.

Where spam should be reported is when a home user gets some from an Australian source. But to suggest that people disable their spam filters is absolute nonsense. The volumes are far too high for such wishful thinking. Like it or not, spam exists and the perpetrators are going to be just as hard to track down in the future as they are now.

I shudder to think of the effect of turning off our filters here when we process over 80,000 messages a day. And with 1,000 employees, that is an awful lot of mail for people to deal with and report to the police.

A far better option is to use a honeypot approach; have the police create some addresses, make a couple of usenet postings and watch the spam roll in.

For those who still access usenet, obscure your domain. That is, instead of putting bob@hotmail.com as your address, put bob@hotmail-no-spam-mail.com. If you obscure your username, your provider or employer will

be dealing with garbage forever. If you obscure the domain instead, the spammer won't get off the ground because the mail will fall on the domain lookup and it will only clog the spammer's system (or their ISP).

The solution to spam will always be a multi-tiered approach incorporating filtration, legislation and simply making it harder for someone to spam you by hiding who you are.

James Farrow
Wellington Point, Qld

LINUX OPTIMISATION ADVICE

Noel Cunningham says Linux is sluggish and bloated compared to Windows (APC March, page 30). Has he tested any of the three Fedora releases since version 9, which came out before Red Hat focused on optimising its distributions for desktops? The change in the newer versions really shows. My Athlon 650 running Fedora Core 3 is about twice as fast at loading as Red Hat 9.

Common speed problems with Linux include the hard drive configuration. To ensure maximum compatibility with older motherboards, some distros don't turn on direct memory access (DMA), resulting in the drives running at 33MB/s. Default Red Hat 9 installations are often like this and it kicks performance in the teeth. But since the desktop push, DMA is automatically set.

Also, consider running xfce as the window manager. Customising is a little harder than the popular alternatives, but the speed boost is worth it.

For new users, SUSE or Mandrake are more user-friendly Linux distributions than Fedora or Red Hat. They have more comprehensive media playback utilities built-in, for example.

New users often complain that they install a Linux distribution but it doesn't work as they expect. It always pays to check how old the disk is before installing it. Over 18 months is too old, because Linux is evolving at a substantially faster rate than Windows. In most cases, downloading a new version is free, or Everything Linux will mail you an installer disc for less than \$50. Alternatively, APC regularly have distros on its cover DVD.

It cost me over \$200 to get a copy of XP Professional. This is the same as four full Linux updates purchased from Everything Linux. Worried about not getting support for Linux? Try getting support for Windows! You'll either be paying Microsoft big bucks per support call or relying on the goodwill of the person who sold it to you.

Peter Dolding
Maryborough, Qld

Agenda: Your place to vent

CRIPPLED BROADBAND

Telstra has finally started implementing automated broadband speed capping, which means no more ambiguous "you may be capped" rules. Now, if you go over 10GB (or 20GB depending on your plan) you will definitely be throttled down to 64Kbit/s — just fractionally faster than dialup.

Telstra customers on cable also have a pathetic upload speed cap of 128Kbit/s at all times, and the telco rubs further salt into the wound by counting uploads towards your monthly download quota, unlike virtually every other ISP.

Why Telstra sets its download limit on its cable plans at 10GB is beyond me. BigPond ADSL customers can get up to 20GB, and on most other ISPs it's much more.

The Government is talking about trying to provide better broadband, yet the half-government-owned telco is still providing us with the Whitman's Sampler of broadband.

Telstra's competitors are getting out there with their own DSLAMs and offering, as a starting point, the full 8Mbit/s speed that an ADSL1 connection is capable of, with promises of speeds up to 24Mbit/s when the ADSL2+ standard is approved for use.

Meanwhile, Telstra still insists on capping its "unlimited" ADSL to the low 1.5Mbit/s speed on its "fastest" plans. They're bean counters, so vote with your wallets.

Alex Miskin
Fig Tree Pocket, Qld



Getting slammed: Telstra's automated speed capping means the competition is leaving it in the dust.

SUCKER FOR SUSE

Inspired by the frequent Linux releases on the APC cover discs, my ongoing trial and error approach to Linux has left me wondering

► whether I'll find ever the appropriate Linux distro for me.

From the release of Red Hat 7 to the latest Fedora Core 3, I had consistent issues relating to hardware detection and software bugs. My exploration delved further into Knoppix, Debian, Mandrake, Linspire and even Xandros. These distributions either left too much up to the end user, or not enough.

On receiving the February issue of APC, I was delighted to see yet another distro I'd yet to explore, SUSE. Although I hadn't been following the development of SUSE, I thought I'd give it a go. To my delight I found it easy to use, yet with the flexibility I was after. SUSE is the first Linux distro I have found to be a real alternative to Windows. I no longer dual-boot and am running SUSE full-time.

My congratulations go to Novell and the SUSE development team, great job!

Antoine Waugh
Sydney, NSW

Prize Pit

The lucky winners of our March subscription prize of 1 of 10 Brother MFC-620CN Multi-Function Centres are P. O'Brien of North Rockhampton, Qld; K. Cook of Yandina, Qld; S. Rosenbaum of New Farm, Qld; S. O'Callaghan of Eaton, WA; G. Rogers of Blackwater, Qld; A. Carrington of Avalon Beach, NSW; P. Unicorn of Kiama Downs, NSW; A. Ryan of Mount Eliza, Vic; R. Schadwell of Warwick, Qld; and P. Neldner of North Adelaide, SA. Congratulations!



Have your say

Add to these discussion threads or email your views (in fewer than 500 words) to epinions@apcmag.com.

All correspondence becomes the property of APC and is subject to editing. Letters sent to epinions@apcmag.com must include the writer's full name, suburb, state and phone number to be considered for print publication and in the running for letter of the month prizes. Phone details will not be published.

DELL M.I.A.

On the day the March 2005 edition of APC arrived in the mail, I just happened to be in the market for a powerful new notebook with a 17in screen. Thus I was very pleased to see your review of the Dell Inspiron 9200 and its Highly Recommended rating. I have had a preference for Dell notebooks for many years, and your review confirmed my views.

But when I went to the Dell Web site, there was no Inspiron 9200 on offer, just the 9100 without the 17in screen. I called Dell and was told that the 9200 had been taken off the market because it was about to be replaced with new models. "When?" I asked. "I can't tell you that," came the reply.

When APC chooses which products to review in the future, you might like to obtain some indication from the manufacturer as to how long that product is to remain on the market. Your efforts to review the Dell Inspiron 9200 seem to have been a waste of time and magazine space.

Lloyd Borrett
Kilmore, Vic

Technical editor Matthew Overington responds: We certainly do seek such assurances from manufacturers. We followed up this situation with Dell and received the following response: "The Dell Inspiron 9200 was replaced by the newer Sonoma-equipped Inspiron 9300 on 25 February 2005. The Inspiron 9300 has the same look and feel as the Inspiron 9200, but with newer technology. The Inspiron 9200 was meant to be available in Australia up until 25 February, but due to higher than expected demand of the Inspiron 9200, there was a 10 business day gap before the Inspiron 9300 became available. This meant that APC readers would have had to wait 10 business days before they could order their 17in wide-screen Dell notebook online, but when they did, they got the latest technology available to date. Dell sincerely apologises for any inconvenience."

Matt Overington adds: the 9300 was also tested in APC April (page 34) and received a highly recommended rating.

Error Log

In APC March, it was incorrectly stated that Nokia's 9500 Communicator is \$2,000. The correct retail price is \$1,499. APC apologises for any inconvenience caused.



Ricoh introduces a new concept in laser printing—low cost b&w and controlled access to colour.

If your office printing need is mainly for black-and-white documents with only the occasional need for colour pages, then Ricoh created the CL4000DN with your business in mind.

If you thought you couldn't justify the additional black-and-white running costs of a colour laser printer, now you simply can't afford not to. The CL4000DN has the ability to print black-and-white at standard black-and-white laser printer prices.

And for around the same price of a similar black-and-white printer plus a separate business colour inkjet, you get the flexibility and convenience of low cost network laser colour printing in one unit. This is your chance to rid yourself of those crippling ink jet and outsourcing costs.

Plus with user code access, you can run the CL4000DN as a standard black-and-white network printer, giving controlled colour access to those who really need it.

With the CL4000DN Ricoh has removed all barriers to upgrading to a colour printer so you can truly experience printing Nirvana.

To find out more, call Ricoh on 1800 181 002 or visit www.ricoh.com.au

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HP rx 3715



XDA II / i-mate



HP 4150*



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REAL WORLD
★ TESTING ★

OnTest

Detailed product reviews and comparisons

apc Labs Challenges

60 System Sub-2kg wide-screen notebooks

Mix business and pleasure on the road without breaking your back. Tim Dean warms his lap with six mighty machines.



66 Hardware Nvidia nForce Ultra and SLI motherboards

Nvidia has followed up its nForce chipsets with a new offering for Athlon 64s. Nick Race checks just how fast they can go.

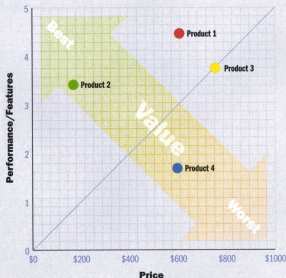


72 Hardware PDA phones

Can a PDA and mobile phone really combine to make one super gadget? Anthony Caruana road-tests 10 units.



apc price-to-performance ratio



The APC price-to-performance ratio is a scatter graph, each point representing a reviewed product. The X axis represents price, and the Y axis indicates features and performance as derived from the verdict awarded to each item. The diagonal line represents a line of expectation — as prices increase, a proportional increase in features or performance is also expected.

40 CPU Intel 6xx series

Intel finally joins AMD in the 64-bit race, ushering in a new wave of computing to boot. Matthew Overington checks out the new range.

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The XC Cube may have a modern housing, but its features haven't caught up yet.

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Finally, a thin film transistor screen graphic designers can get excited about.

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Sonoma-based portables are heating up, as this unit attests.

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A lounge room-oriented computer designed to be seen, not heard.

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It's compact, sturdy and an ideal choice for the home or small office.

52 Hardware Iomega REV Serial ATA drive

Iomega's latest no-fuss backup solution moves with the times.

53 Software Registry Mechanic 4.0

Feature improvements make this handy utility worth the upgrade.

54 Hardware Sitecom USB 2.0 Universal Dock

A clever solution for notebooks makes life easier for desktop pit stops.

54 Hardware XpertVision Nvidia GeForce 6200

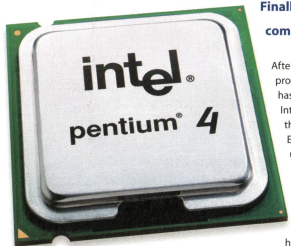
This video card strikes a balance between price and performance.

56 Best Buys

Every month, APC's technical editor Matthew Overington compiles this guide to the hottest software and hardware products on the market.

Intel 6xx series hardware

Finally, Intel joins AMD in the 64-bit race, ushering in a new wave of computing to boot. **Matthew Overington** checks out the new range.



Now I'm 64-bit: a rush of compatible apps should follow the release of Intel's new processors.

Details

Contact	Intel
Phone	(02) 9937 5800
Online	www.intel.com.au

Price	Pricing is per processor in 1,000-unit quantities
	660 (3.6GHz), US\$605; 650 (3.4GHz), US\$401; 640 (3.2GHz), US\$273; 630 (3GHz), US\$224; 3.73GHz P4EE, US\$999

Intended market	Prosumers
-----------------	-----------

✓	Performance boost.
---	--------------------

✗	Reduced differences between P4 and P4EE lines; no 16-bit support in compatible version of Windows XP; slower than AMD Athlon FX-55.
---	---

Verdict	★★★★☆
---------	-------

After 18 months as the 64-bit processor market leader, AMD finally has some company on the desktop. Intel has released 64-bit versions of the Pentium 4 and Pentium 4 Extreme Edition (P4EE) platforms, ushering in a new wave of software releases. Intel has long asserted it would produce 64-bit hardware as soon as Microsoft provided a supporting OS, and it looks as if this promise has held true — Microsoft is putting

the finishing touches on a version of Windows XP capable of driving the processors in 64-bit mode.

Intel has launched five new processors: four new Pentium 4s (clocked at 3GHz, 3.2GHz, 3.4GHz and 3.6GHz), and one P4EE clocked at 3.73GHz. The new models are dubbed Pentium 4 processor 660 (3.6GHz), 650 (3.4GHz), 640 (3.2GHz), and 630 (3GHz). All are designed around the Socket 775 architecture with support for the EM64T extensions, and fit current generation i915/925 boards (925XE in the case of the Extreme Edition). While EM64T-compatible versions of the Xeon have been available for several months, this

is the first time Intel has shoehorned the features into the Pentium 4 line.

At the launch, Intel Australia marketing manager Phil Dows said, "Though Intel didn't invent Wi-Fi, we took it to the mass market." He was alluding to the fact that while AMD was first to release a processor capable of running 32- and 64-bit applications side by side, Intel is relying on its position as market leader to help drive adoption.

PAPA'S GOT A BRAND NEW BAG

There are several new features gracing the Pentium 4s, namely support for 64-bit extensions, SpeedStep and a 2MB cache (the previous release was 1MB). These are mostly about providing additional functions above and beyond raw performance — current marketing trend dictates that processor manufacturers prefer to highlight what can be done with a platform over how fast it is.

Support for the Execute Disable Bit (called No Execute by AMD) is also included. This prevents the execution of unauthorised code, providing basic,

chip-level protection from some worms and viruses. It's enabled by Windows XP Service Pack 2 and can help stop worms like MS Blaster from spreading.

SpeedStep, initially developed for mobile computing, is designed to scale back a processor's power requirements based on load, leading to a more power-efficient and quieter PC. The idea is that desktop computers don't need to run at a blistering pace if they're only being used for productivity applications or surfing the Web, and therefore the processor can scale back its power demands and reduce thermal output accordingly.

All five new processors support Hyper-Threading. In fact, the only real differences between the Pentium 4 and P4EE lines are that the latter runs at a higher frontside bus speed (1,066MHz instead of 800MHz) and doesn't feature SpeedStep. The rationale behind excluding the power-saving technology brought over from the mobile space is that the product line showcases the best performance Intel has to offer, which means consistently running the processor at full whack.

A 2MB cache was one of the significant features of the P4EE, and increasing the Pentium 4's cache to match it reduces the Extreme Edition's value to some extent. As the Extreme Edition is more expensive than the regular Pentium 4 series, and the company is keeping the line to showcase its technology, Intel has disclosed that its first dual core processor will be an Extreme Edition, due later this year.

All of Intel's 9xx chipsets support 64-bit extensions, so early adopters of the Intel-based PCI Express platform should be able to drop a new processor into their motherboard (provided 64-bit drivers are available), install a 64-bit version of Windows XP or Linux, and move to a next-generation system.

APPLICATION SUPPORT

Of course, these technologies aren't worth much without a suite of software applications to take advantage of the 64-bit word lengths. Thus far, the release of 64-bit native software has been slow. Microsoft has repeatedly delayed the release of a compatible version of Windows XP Professional, and is only now polishing off a final build of the OS. Expected on the market by the time you read this, it should trigger a steady flow of software releases in the following months as the industry gets behind mainstream 64-bit computing.

It's not all roses, though. Microsoft's 64-bit OS completely removes legacy support for 16-bit applications, which means that older DOS software won't be able to run. This won't concern home users, but large corporations or government departments still tied to running legacy applications will have issues. For this reason, Intel has admitted that 32-bit processors will be available long into the future.

ON THE BENCH

APC Labs relied on Microsoft's Second Release Candidate of Windows XP Professional for 64-bit Extended Systems for testing the new Intel processors. The OS remained stable during the review process, running the APC Labs standard suite of benchmarks without fault. We tracked down 64-bit versions of Intel's motherboard drivers, and though only 32-bit benchmarks could be run at this stage, a performance boost was discernible (this can also be attributed to the increased processor cache).

A 3.6GHz Pentium 4 Processor (660) was tested head-to-head with a 3.6GHz model from the previous generation of desktop chips (560). Each processor was run on an Intel i925X reference board with 1GB of 533MHz DDR2 memory, a single 250GB Maxtor MaxLine III hard disk and Nvidia GeForce 6800 GT video card. A 3.73GHz P4EE processor was also benchmarked with the same hardware, except an Intel i925XE motherboard was used.

A Release Candidate 2 version of Windows XP Professional for 64-bit Extended Systems was trialled with the new Pentium 4 processors, while the 560 was given a workout with the 32-bit version. Service Pack 2 was installed on both, along with Intel's platform drivers.

The Labs tests produced some interesting results. Multimedia Content Creation Winstone 2004 scores went from 35.4 under the 560 to 36.1 under the 660, a gain of around 2%, while the P4EE scored 36.8. For further comparison, all benchmarks were run through an AMD Athlon FX-55 system based on an ASUS A8V Deluxe motherboard with 1GB of DDR memory and the same MaxLine III hard disk. The Athlon system topped the performance benchmarks with a score of

39.2 under Multimedia Content Creation Winstone 2004.

The Multimedia Content Creation Winstone 2004 result was taken as an average from a number of application tests, so SiSoft Sandra 2005 was installed and a set of processor and bandwidth analyses run to single out the source of the improvement.

Not surprisingly, the 660 showed a gain in bandwidth, thanks largely to the increased cache. The Whetstone FPU test produced scores of 7,224 for the 660, 7,192 for the 560, 7,476 for the P4EE, and 5,306 for the FX-55 system. The Whetstone FPU benchmark backed this up with scores of 10,538, 10,520, 10,993 and 11,984 respectively. RAM Integer Bandwidth produced scores of 5,012MB/s, 4,886MB/s, 6,344MB/s and 6,110MB/s, while the RAM Floating Point Bandwidth was pegged at 4,877MB/s, 5,001MB/s, 6,332MB/s and 6,112MB/s respectively.

The Pentium 4 generally performs well under media encoding tests, so a video file was converted from raw DV to Windows Media 9 format using Windows Media Encoder 9. The conversion took five minutes and 12 seconds using the Pentium 4 660, five minutes and 18 seconds under the 560 and five minutes and 28 seconds under the FX-55. The Pentium 4 Extreme Edition topped the chart at five minutes flat.

AMD INSIDE

AMD had 64-bit systems available 18 months before Intel managed to get its product to market. But now that both platforms are on the same page, expect 64-bit applications to follow as software developers rally behind the technology. The benchmarks showed some small performance improvements in moving to a 64-bit architecture, even for 32-bit applications. However, the real gains won't follow until all drivers and software are released in 64-bit flavours towards the end of this year.

The 64-bit platform isn't for everyone, but geeks and technophiles should rejoice — mainstream 64-bit computing is finally here. AMD has more accumulated miles in this space, though, and benefits from its more extensive marketplace experience. ETB

Benchmarks

Multimedia Content Creation Winstone 2004

0 Pentium 4 560	35.4	40
0 Pentium 4 660	36.1	40
0 Pentium 4 EE 3.73GHz	36.8	40
0 AMD Athlon FX-55	39.2	40

SiSoft Sandra 2005 Whetstone FPU

0 Pentium 4 560	7,192	10k
0 Pentium 4 660	7,224	10k
0 Pentium 4 EE 3.73GHz	7,476	10k
0 AMD Athlon FX-55	5,306	10k

SiSoft Sandra 2005 Dhrystone FPU

0 Pentium 4 560	10,520	15k
0 Pentium 4 660	10,538	15k
0 Pentium 4 EE 3.73GHz	10,993	15k
0 AMD Athlon FX-55	11,984	15k

SiSoft Sandra 2005 RAM Integer Bandwidth (MB/s)

0 Pentium 4 560	4,886	10k
0 Pentium 4 660	5,012	10k
0 Pentium 4 EE 3.73GHz	6,344	10k
0 AMD Athlon FX-55	6,110	10k

SiSoft Sandra 2005 RAM Floating Point Bandwidth

0 Pentium 4 560	4,877	10k
0 Pentium 4 660	5,001	10k
0 Pentium 4 EE 3.73GHz	6,332	10k
0 AMD Athlon FX-55	6,112	10k

Windows Media Encoder 9 Video Conversion RAW DV — Windows Media (mins:secs — lower is better)

0 Pentium 4 560	5:12	6:00
0 Pentium 4 660	5:18	6:00
0 Pentium 4 EE 3.73GHz	5:00	6:00
0 AMD Athlon FX-55	5:28	6:00

Dual core

With 64-bit processors finally here, dual core processors from AMD and Intel are anxiously awaited. Intel has disclosed that its first dual core processor will be an Extreme Edition part, with desktop and server models to follow shortly after. Dual core technology packs two processors into a single physical die, leading to massive performance gains in running multiple applications side by side. As Hyper-Threading already splits a single physical processor into two virtual processors, it's safe to expect the new dual core models to sport four virtual cores.

Test drive

Momentum for 64-bit processing is gaining as Microsoft prepares to release a final version of Windows XP Professional for 64-bit Extended Systems. There's no need to wait, though. If you're game, a 64-bit trial version is available from the Microsoft Web site. APC strongly recommends using a partitioning program to non-destructively create space to install the OS.

Apple Mac mini

The latest system from Apple is small, versatile and has a price tag that will leave you with plenty of cash to customise its specs.



Where's the computer? Apple's Mac mini is smaller than some external optical drives.

Alternatives

If you don't have a spare keyboard, mouse and monitor, consider an iMac instead of the mini. Based on the PowerPC CPUs, the iMacs are available in 1.6 and 1.8GHz configurations. They start at \$1,999, but you'll get a faster system with a more capable GPU and a space-saving design.

Details

Contact	Apple
Phone	13 36 22
Online	www.apple.com.au
Price	1.25GHz/40GB model, \$799; 1.42GHz/80GB model, \$949

Intended market	Everyone
-----------------	----------



Low price for a decent specification.



Limited internal expansion.

Verdict



Apple is reaching out to a wider market with a one-size-fits-all PC for desktop use.

You'd expect any product called "mini" to be small, but Apple's latest desktop could be mistaken for an external drive, measuring only 16.5 x 16.5 x 5.2cm (WDH). The brushed aluminium and white plastic design visually links the mini with other Macs and the iPod.

There are two versions of the mini: the 1.25GHz G4 processor base model with a 40GB hard disk, and the higher-specification 1.42GHz with an 80GB hard drive (reviewed here).

The mini ships with 256MB of RAM as standard, unlike the 512MB included in the latest iMacs and PowerBooks, but it didn't become a concern during testing until several memory-hungry applications were run simultaneously. An upgrade to 512MB officially costs \$120 and 1GB is \$520, though a dealer might do better. Note that there's only one RAM slot, so the existing RAM must be replaced when upgrading.

The preinstalled software means it can be put to use straight out of the box, though all applicable updates, including Mac OS X 10.3.8 (it came with 10.3.7), were installed before testing. The bundle includes iLife '05 (the latest versions of iTunes, iMovie, iDVD, iPhoto and iPhoto and iPhoto), AppleWorks 6 (which lacks iLife's pizzazz, but is still serviceable for everyday word processing, spreadsheets, databases and graphics) and two games (Nanosaur 2 and Marble Blast Gold).

The standard optical drive is a slot-loading 24x/16x/24x unit that reads DVDs at 8x. The optional DVD-burning SuperDrive is \$155 with rated maximum speeds of 24x/8x/16x for CDs. DVDs are read at up to 8x, while maximum write speeds depend on the media: 4x for $\pm R$, 2.4x for +RW and 2x for -RW.

WELL CONNECTED

The mini's back panel is home to 10/100Mbit/s Ethernet, modem, video, dual USB 2.0, FireWire and headphone ports. There's no audio input — for that you'd need to add a USB or FireWire device, perhaps an iSight camera. The internal speaker is adequate

for background music if you select the "small speakers" preset in the iTunes equaliser, but even cheap powered speakers are an improvement.

Video output is via a DVI connector, and a DVI-to-VGA adaptor is provided, taking care of most computer displays and some flat panel TVs. An optional \$35 DVI-to-S-Video/composite adaptor allows connection to devices such as TVs and projectors. The mini supports resolutions from 640 x 400 to 1,920 x 1,200 (DVI) or 1,920 x 1,080 (VGA).

In benchmarking, the mini managed a respectable 124 under Xbench 1.1.3, making it quicker than an eMac G4 despite its relatively slow 4,200rpm drive. It's still decidedly slower than an iMac G5 or a Power Mac G5, though this is expected considering the price difference. In terms of real world activities, audio CD tracks were imported from iTunes at between 6x and 7x and GarageBand just managed to play six synthesised instruments simultaneously.

SPECING UP

The system weighs only 1.3kg and its rubbery base plate keeps it stable. The power adaptor is surprisingly bulky, but its mains and low-voltage cables are both reasonably long, providing flexibility of arrangement. Apple offers USB and Bluetooth keyboard/mouse packages (\$100 and \$198 respectively), or you can use third party items — but check the availability of Mac drivers to ensure full functionality of any extra buttons.

Other choices are limited: \$80 replaces the 1.25GHz model's 40GB drive with an 80GB unit, and both models accept Bluetooth (\$79) and 802.11g AirPort Extreme (\$119) adaptors as either build-to-order or retrofitted options. None of these items are considered user-installable, and only brave owners will try to crack open the case.

So who will buy the mini? Those who have always wanted to try a Mac but were discouraged by the cost for a start. It would also suit those who'd like a computer for the car or boat (it's small enough to replace a standard car radio, but the 18.5V power supply adds to the complexity).

And as this system runs very quietly, it would sit nicely beneath a plasma or LCD screen as a media centre when hooked up with third party TV and radio tuners. The Apple Store does offer such products, including the Elgato EyeTV 200 TV tuner (\$620), which lets you watch, record and time-shift TV broadcasts; and the Griffin Technology radioSHARK USB AM/FM radio (\$120), which allows you to save favourite stations as presets, and can record and time-shift radio broadcasts.

Stephen Withers



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Mitsubishi Electric Diamond Digital networking products

Two new additions to the Diamond Digital networking range helps bolster the product line.

Diamond Digital has released a new range of networking components as a follow-up to the release of the R100 wireless gateway, A101 USB adaptor and A111 PC card (APC January, page 38). This new kit supports 802.11b/g networking, cementing Diamond Digital as a player in the wireless networking space.

With the release of the new A202 key adaptor and A222 PCI adaptor, it was necessary to retest the R100 gateway. This gear is really for the home, but it would suit a small business too, as it features strong security and a straightforward setup interface.

Each device in the range includes support for 64- and 128-bit WEP/WPA encryption. They all support the 802.11b/g wireless networking standards and ship with drivers for Windows 98SE, Me, 2000 and XP. Linux and Mac users don't specifically get a look in.

At the centre of the Diamond Digital network is the A100 wireless gateway, designed to share a network connection between four wired clients as well as wireless ones. It includes a WAN port, built-in DHCP server and four 10/100 Ethernet connectors. The device is configured and managed via a Web browser. Basic content filtering and blocking is also available.

One of the great features of the A100 is the integrated USB port that enables users to share files, Webcam images or a printer across all the devices connected to the gateway. This means it's possible to attach a USB hard disk to the device as an inexpensive network storage drive, or turn a regular USB printer into an office workhorse.

A202 USB KEY ADAPTOR

Though Diamond Digital offers a USB adaptor roughly the size of a deck of cards, the company delayed the release of a key drive until it could work through the technical hassles inherent in shrinking the technology. The device itself is roughly the same size as most popular USB memory keys and is easily thrown into a notebook bag or pocket.

One of the biggest concerns with employing a small, key-style USB adaptor is antenna size and its limited range and performance. Though the key can be plugged directly into a USB port, the packaging includes an extension cable and swivelling adaptor, allowing you to position the key for optimum signal strength. There's no provision to plug in an external antenna, but given

that much of the A202's appeal is its portability, this isn't a major problem.

In testing, the A202 managed solid performance at close range (15.22Mbit/s at 1m), though this tapered off as soon as it was moved further away from the access point. In fact, the key only managed a transfer speed of 3.63Mbit/s at the farthest testing position (15m away, through 30cm of concrete). The device would be most useful for people with older notebooks that don't feature integrated wireless support, as there are alternatives for desktop users with better range (Diamond Digital's own A101 is a prime candidate).

A222 PCI ADAPTOR

Another new addition to the family is the Diamond Digital A222 PCI adaptor. The card features full support for WEP and WPA encryption and is designed to fit into a desktop case. The half-height card is low enough to fit into most small form factor cases too, making it straightforward to integrate into almost all PC setups. The basic card ships with a small desktop antenna attached to a 60cm cable via a SNA connector.

In testing, it managed to achieve data transfer rates of 20.12Mbit/s at a range of 1m, and 6.47Mbit/s at 15m through 30cm of concrete. These figures, substantially higher than those achieved by the A202 USB key, highlight the benefits of using a larger, external antenna.

One area where the Diamond Digital wireless products really stand out is their documentation and software package. All products ship with a fold-out quick start guide that graphically takes the user through the steps of setting up the device, along with a user manual that covers hardware features and installation, configuration and software bundles.

The only real area of concern with the software is the fact that each hardware component doesn't ship with WEP or WPA turned on by default. This is deliberate, though: Diamond Digital would rather the user establish a connection and then enable the security options than be faced with an over-zealous security system that makes it difficult to get the network up and running in the first place.

These releases expand the Diamond Digital networking range to five products — a wireless key adaptor, PC Card adaptor, PCI adaptor, USB adaptor, and wireless LAN gateway. All products share the same three-year warranty with weekday 9am to 9pm phone and email technical support, making them compelling choices for home or small business. Just remember to enable the security.

Matthew Overington



The Diamond Digital wireless range: the R100 wireless gateway, A202 USB key adaptor and the A222 PCI adaptor.



Details

Contact Mitsubishi Electric
Phone (02) 9684 7777
Online www.mitsubishielectric.com.au
Price R100, \$219; A202, \$119; A222, \$109

Intended market Everyone

Good documentation; solid performance.

Security disabled by default.

Verdict ★★★★★



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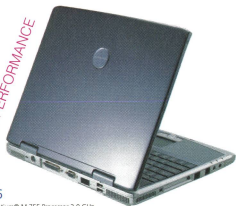


MEDIA CENTRE

D495

Intel® Pentium® 4 Processor 3.2GHz
Intel® Celeron® Processor 2.8GHz
128MB ATI Radeon 9700 graphic
17" 1440*900 WXGA display
256/512/1024MB DDR Memory
40/60/80/100GB HDD
DVD Dual Drive
Built-in Camera

PERFORMANCE



G556

Intel® Pentium® M 755 Processor 2.0 GHz
Intel® Celeron® M 340 Processor 1.5GHz
128MB ATI Mobility Radeon 9700 graphic
15" 1400x1050 SXGA+ display
256/512/1024 MB DDR Memory
40/60/80/100GB HDD
DVD Dual Drive
Windows® XP Home Edition

ALL ROUNDER



D43EF

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Intel® Celeron® Processor 2.8GHz
15.1" 1024x768 XGA display
256/512/1024MB DDR Memory
40/60/80/100GB HDD
Combo (DVD+CD-RW) DVD Dual Drive
Built-in Camera

SCHOOL WORKS



532

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14.1" 1024x768 XGA display
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Combo (DVD+CD-RW) DVD Dual Drive

64 - BIT POWER



D410J

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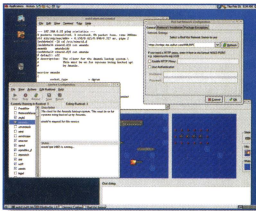
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Red Hat Enterprise Linux 4

A lack of new features gives current users few reasons to upgrade.



Old hat: Red Hat Enterprise Linux 4 seems a little too familiar...

Mandrake

Looking for a Linux-based alternative? Mandrake has recently released its corporate-ready line of distros. The OS includes kernel 2.6, KDE 3.2 and support for x86 and x86-64 architectures, and Mandrake Corporate Desktop 3 starts at US\$109.90. More information can be found at www.mandrakesoft.com.

Details

Contact	Red Hat
Phone	(02) 8923 2800
Online	www.redhat.com.au
Price	AS Standard (3-year support), \$5,862; AS Premium (3-year support), \$9,560; ES Standard (3-year support), \$3,124; ES Basic (3-year support), \$1,655; WS Standard (3-year support), \$1,145; Desktop, free

Intended market	Business
✓	Multiple versions; solid security.
✗	Few reasons to upgrade.
Verdict	★★★★☆

The 2002 release of Red Hat Enterprise Linux (RHEL) marked the end of Red Hat's days as a provider of free Linux operating systems. It also signalled the company's move to a more professional model to compete with OSes intended for corporate use, such as Sun Java Desktop and Solaris.

Linux distros are often criticised for being "one size fits all" solutions which are inefficient for customising to a particular purpose. RHEL could never be accused of that — the

OS is available in Advanced Server (AS), Enterprise Server (ES), Workstation (WS) and Desktop editions. All versions share the same core; the differences are in hardware support and package selection (which helps to avoid package bloat). Throw in the range of Web and phone support packages and there are over a dozen variations available. Prices range from free for the Desktop edition through to \$9,650 for the AS Premium package with 24/7 online and phone support for three years.

The Workstation version is aimed at corporate users in a range of industries, and supported platforms include Intel x86, Itanium 2, and AMD64/EM64T.

A FRESH KERNEL

Red Hat has replaced the 2.4 Linux kernel from version 3 with a 2.6 kernel. The latter provides increased hardware support and scalability.

Throughout the review period, several attempts were made to install the OS on a number of x86 systems, including an older Socket 478 Celeron-based machine with i865 chipset and parallel ATA drive, and a new Socket 775 Pentium 4 with an i915 chipset and Serial ATA hard disk. The OS installed without errors on the first system, but couldn't accurately detect the Seagate Serial ATA hard disk on the second. The ICH6 controller was responsible for this, but since this hardware is now almost a year old, there's no excuse for RHEL not to support it natively.

Subsequent tests using an AMD Athlon 64-based MSI K82 Neo2-FIR motherboard with non-RAID Serial ATA hard disks worked flawlessly. If you're planning to deploy the OS over numerous workstations, check that all hardware is fully supported first.

During installation, Anaconda (RHEL's installer) allows you to select packages individually from the four CD set. The OS includes a rich suite of applications, including GNOME 2.8, Novell Evolution, RealPlayer and Adobe Acrobat Reader. OpenOffice, a productivity suite compatible with Microsoft Office, is also included.

SECURITY AND SUPPORT

If Linux is to gain a foothold in institutional or corporate environments, it's vital that Microsoft networks are fully supported. Red Hat Enterprise Linux 4 integrates neatly with Active Directory and ships with a Microsoft Exchange connector to enable desktops to connect to Exchange servers. Another crucial feature for a corporate environment is the ability for administrators to set security guidelines and ensure that these are followed by each desktop. RHEL also includes some functionality from Security Enhanced Linux, which hardens Apache, BIND and other network services, allowing administrators to set security profiles and control user privileges remotely.

Three support packages are offered — Premium, Standard and Basic. The first includes unlimited 24/7 Web and phone support with a one-hour response time and a choice of either three years or one year of Red Hat Network access, which allows the subscriber to update software during that time. The Standard pack includes 12 hour, five-day per week Web and phone support for unlimited incidents with a four-hour response time, again in one- and three-year options. Finally, Basic has installation, phone and Web support for 30 days, plus access to the Red Hat Network for one year.

While there are some minor tweaks to Red Hat Enterprise Linux between versions 3 and 4, there really aren't enough to justify an upgrade. If this is Red Hat's attempt to get its OS into corporate environments, the company still has some way to go, especially if it is to succeed against rival Linux distros like Mandrake or other corporate operating systems such as Sun Java Desktop or Solaris. Though Java Desktop performs about as well as Enterprise Linux 4, Solaris includes integrated virtualisation features lacking in the Red Hat line.

In the hands of a skilled administrator, even Fedora could be tailored to suit a small business. Red Hat's ability to offer customised versions for several different target markets is its strong point, but the company will have to come up with more compelling feature improvements between versions if it's to convince customers to keep upgrading.

Matthew Overington

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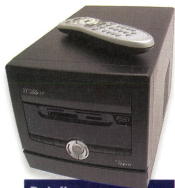
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AOpen XC Cube AV EA915



Details

Contact	Bluechip Infotech
Phone	1800 803 802
Online	www.bluechipit.com.au
Price	\$699
Intended market	Home

✓ Compact, attractive design.

✗ Poor cooling; minor upgrade over previous version.

Verdict ★★★★★

The XC Cube may have a modern housing, but its features haven't caught up yet.

AOpen's EA915 is the latest in its XC Cube AV small form factor series, refreshed to utilise Intel's 915G chipset. The case has four USB 2.0 ports (two front, two back), three FireWire ports (one back, two front), S/PDIF in/out, front and back audio/mic jacks, VGA/composite out, Gigabit LAN, serial and parallel ports and PS2 mouse/keyboard ports. It also has a 7-in-1 card reader and front controls for operating in Instant-On mode. This lets the machine function as a basic AV box without booting into the main OS.

The 915G chipset brings some great features, such as LGA775 processor support, dual-channel DDR RAM, integrated Intel GMA 900 accelerator, PCI Express and four Serial ATA ports. The EA915 supports Pentium 4 Prescott CPUs up to 3.6GHz, up to 2GB of RAM and Serial ATA RAID arrays.

Unfortunately, it only has a Realtek 5.1 audio codec instead of the Intel HD 7.1 standard. It has one PCI Express and one standard PCI expansion slot.

Internal space is limited to one 5.25in and one 3.5in mounting. A 275W PSU is fitted, which is fine for the basic components, but the internal cooling

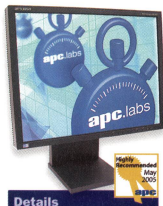
isn't great. There's a dedicated extraction fan for the heatsink, and ventilation holes on the right side panel to maximise airflow, with more in the left panel to cool the expansion cards. However, space is limited once the internals are mounted and cabled, and the PSU fan is the only cooling option, potentially causing heat issues.

The EA915 is bundled with Microsoft's Windows XP Media Center Edition 2005 (MCE), remote control and IR receiver. It also has an AOpen P179 TV tuner card with MPEG-II encoding and antenna inputs, but there aren't any composite inputs. Video output clarity isn't bad using composite output, but you'll need an expansion card for DVI or S-Video quality.

To turn this into a decent MCE machine, you'd need to outlay an extra \$700-\$800 (Pentium 4 LGA775 3GHz, 512MB PC3200 RAM, 200GB Serial ATA HDD, GeForce 6200), bringing the total to around \$1,500. The XC Cube series was designed before MCE was available and the Instant-On feature is now found on many systems, but AOpen has made no improvement other than the upgraded chipset. These factors, combined with poor cooling and an underpowered PSU, make the expense hard to justify.

James Bannan

Mitsubishi Electric DiamondPoint UX21LCD monitor



Details

Contact	Mitsubishi Electric
Phone	(02) 9684 7777
Online	www.mitsubishielectric.com.au
Price	\$2,295
Intended market	Prosumers/professionals

✓ Clear, bright display; great colour reproduction; good ergonomics.

✗ Weak dead pixel policy.

Verdict ★★★★★

Finally, a thin film transistor screen graphic designers can get excited about.

While TFTs have been popular with the average PC buyer for several years, graphic designers and video editors have shunned them in favour of CRTs due to poor image quality.

Mitsubishi is pitching its DiamondPoint UX21LCD screen as a viable alternative to CRT for video or image editing applications due to its colour accuracy. The sleek 21.3in black unit boasts a thin bezel, a native resolution of 1,600 x 1,200 pixels, 20ms response time, brightness rating of 250cd/m², and support for dual inputs (one analogue and one digital). The display features intelligent technologies such as CableComp (which adjusts the image to compensate for a degraded signal from a long VGA cable) and GammaComp (which does internal conversion on the data from the PC to provide smooth colour tones).

The bundle includes a power supply, DVI-D to DVI-D cable for PCs with digital outputs, and a VGA to DVI-A cable for analogue connections. A cable cover is bundled along with the standard user manual and driver CD-ROM. The onscreen menu works effectively and allows the user to manually

adjust elements of the image. Automatic adjustment is available to analogue connections, but not if the screen is digitally attached to the computer.

The impressive stand features a number of extremely handy ergonomic adjustments, including a height-adjustable base and swivel stand. The screen itself is ball-mounted to the stand, allowing the face to be angled exactly as required. Better still, a screen pivot function is included to allow the user to switch between portrait and landscape modes. There's no automatic gyro inside the screen to detect the orientation, but this isn't a major issue as a switch can be found in the onscreen menu.

In testing, the UX21LCD produced the most impressive image of any TFT through the APC Labs to date. Tones were rendered accurately and clear differences were visible in contrast testing. The impressive performance is backed up by a three-year, limited onsite warranty if you're within 50km of a service agent, otherwise it's return-to-base. The dead pixel policy isn't as good, offering replacement for six bright dots or 10 black dots, or 10 total defects.

Its moderate bezel, wide viewing angle, range of ergonomic adjustments and lengthy warranty make the DiamondPoint UX21LCD a great screen.

Matthew Overington

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- PCI LAN Combo Card
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- Intel PRO/Wireless 2200 LAN, 802.11b/g
- Built-in DVD+RW Combo Drive
- Slim & Light: 2.4kg only (Inclusive of Combo Drive)
- 3-in-1 MS/MC/SD Card Reader Slot
- 256MB / 512MB / 1GB DDR 333 MHz RAM
- 40GB / 60GB / 80GB HDD
- 14.1" XGA TFT Screen
- 3 x USB 2.0 Port, VGA Port
- PCI LAN Combo Card
- 64MB Graphic Memory
- Windows XP Home Pre-installed (With Recovery CD)
- Trend Micro Internet Security Anti-Virus Pre-installed
- 3 Years Limited Local Warranty & 1 Year Limited International Warranty

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ASUS W5G00A notebook



Details

Contact	Cassa Australia
Phone	1300 278 788
Online	www.asus.com.au
Price	\$3,299
Intended market	Business
✓	Light; powerful.
✗	Relatively short battery life.
Verdict	★★★★☆

Sonoma-based portables are heating up, as this wide-screen unit attests.

With Sonoma-based machines starting to flow onto the market, ASUS has released a solid ultra-portable based on the new chipset and Pentium M processor. And it has opted for a thin, light, wide-screen machine to maximise the use of available space.

The W5G00A's 12.1in display runs at 1,280 x 800 and features a 1.3 megapixel camera at the top. ASUS Video Security is bundled, which allows the camera to be configured to detect any changes in environment and report any suspicious activity.

Specs include a 1.86GHz Pentium M processor (750), 512MB of RAM and a 60GB 4,200rpm hard disk. The 1.6kg notebook ships with Bluetooth support and a Logitech RF mouse that doesn't require an external dongle. A physical switch toggles 802.11b/g Wi-Fi support, which is useful if you frequently use a notebook in a public space.

The left panel features Ethernet, 4-pin FireWire and USB 2.0 connectors along with the slot for the bundled 24x CD-RW/DVD combo drive and SD/MMC/MS card reader. The right side includes a VGA adaptor, USB 2.0, mic/headphone ports and an

Express Card slot. S-Video and a third USB 2.0 port can be found at the rear of the machine.

A reasonable PCMark04 score of 3,267 shows that the system will make short work of productivity apps and surfing the Web. It doesn't feature a dedicated video processor, so the score of 4,869 under 3DMark2001 SE Pro indicates that Intel's GMA900 video adaptor is only up to driving older games. A relatively poor battery rundown time of two hours and 22 minutes under BatteryMark 4.0.1 with a 6-cell battery means that road warriors will have to carry multiple cells if away from the mains for long periods.

The W5G00A includes Windows XP Professional with SP2, a suite of ASUS applications and a two-year global warranty.

Matthew Overington

Benchmarks

BatteryMark 4.0.1	0	2:22	5
3DMark2001 SE Pro	0	4,869	20K
PCMark04	0	3,267	5K

Hush Technologies Hush E3 MCE



Finally, a lounge room-oriented computer designed to be seen and not heard.

Quiet computing is rare in this day of high-powered processors, video cards and Northbridge modules that all demand serious cooling systems. Noisy PCs are distracting to work with and, with the advent of lounge room computing, extremely intrusive when watching DVDs. Most PC users are willing to put up or shut up, but Hush has taken the quest for quiet to extremes.

The company offers systems built without the use of cooling fans, making them silent to run. Pipes lead from every heat-generating area of the PC to the outer walls of the case, including the 2.8GHz Pentium 4 processor, i865 Northbridge chip, and ATI Radeon X800 video card. The system also has 1GB of dual-channel RAM fitted, along with a 400GB Hitachi Serial ATA hard disk. Front-mounted USB and FireWire ports bolster lounge room functionality.

These specs offer plenty of power for just about any task you're looking to throw at the box, and they help the Hush unit achieve strong benchmark scores. PCMark04 registered a result of 4,469, followed by 18,165 in 3DMark2001 SE Pro and 9,909

under 3DMark03 Pro. These results are good enough to qualify the E3 MCE as a gaming or video editing rig, but where it really stands out is in the hardware engineering. The Hush machine is beautifully constructed, with the entire aluminium chassis acting as a giant passive cooler.

A solution of this ilk doesn't suit every computer user, but is ideal for anyone who values a quiet work environment or is looking for the ultimate lounge room PC. But it's not cheap — the review system retails at \$5,990 with a copy of MCE2005, ShowShifter 3.10, CyberLink PowerDVD 5, Microsoft Word, PictureIt! 10, Encarta Standard 2005 and Money, and Ulead PhotoImpact 6. This price doesn't include a monitor, keyboard or mouse, though it does have a 12-month warranty.

Matthew Overington

Benchmarks

3DMark2001 SE Pro	0	18,165	20K
3DMark03 Pro	0	9,909	10K
PCMark04	0	4,469	5K

Details

Contact	AIM Digital Imaging
Phone	1800 008 899
Online	www.ausmedia.com.au
Price	\$5,990
Intended market	Prosumers
✓	Silent; outstanding build quality.
✗	Limited appeal.
Verdict	★★★★☆

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Konica Minolta magicolor 2400W laser printer



It's compact, sturdy and an ideal choice for the home or small office.

Laser printers are rapidly shrinking, both in price and size. Konica Minolta currently pegs the magicolor 2400W as the smallest four-pass A4 colour laser printer on the market, measuring a scant 40 x 43 x 35cm (WDH). Inside, the device features 32MB of RAM, a 48MHz processor and support for ICC-based colour matching, but only includes a USB 2.0 interface. It's compatible with all versions of Windows from 98SE through to XP, but relies on the Windows GDI to prepare print jobs, so Mac and Linux users are left out in the cold.

The 2400W runs at a maximum resolution of 2,400 x 600dpi and features impressive specs for a \$799 colour laser. The company quotes a rated speed of five pages per minute for colour and 20 pages for monochrome prints, with a duty cycle of 35,000 claims per month. APC Labs tests showed these claims are pretty accurate — the printer was clocked at 4.5ppm in colour and just shy of 18ppm for monochrome prints (after it had warmed up).

Both input and output paper trays can hold 200 pages — ideal for small businesses with moderate demands. One nice feature for busy offices or cluttered homes is that all consumables, paper trays and printouts are accessible from the front of the machine. A two-year onsite warranty is standard.

The 2400W employs polymerised inks and offers individual CMYK toner cartridges and an OPC drum cartridge. There's no waste toner bottle, and the polymerised toner offers reasonable quality with relatively low printing costs.

Though the output quality won't win any awards compared with more expensive models, it's certainly of a high enough quality for sales presentations, school or university assignments and most demands short of catalogues. And though the system does a reasonable job with photos, it can't quite match the quality of dedicated ink units.

All up, Konica Minolta is on to a winner. The high duty cycle ensures that the machine will appeal to small businesses with an eye on the bottom line, but it's equally at ease in a home environment with modest requirements.

Matthew Overington

Details

Contact	Konica Minolta
Phone	1800 265 687
Online	www.printer-konicaminolta.com/au
Price	\$799
Intended market	Small business/everyone
✓	Fast; good quality; few consumables.
✗	No built-in networking.
Verdict	★★★★★

Iomega REV Serial ATA drive



Iomega's latest no-fuss backup solution moves with the times.

The ZIP drive was one of the big industry success stories of the '90s. Iomega's consumer-level backup product became the de facto standard for storing and transporting large files before CD burners came along. Many PCs shipped with internal ZIP drives; as a result, they enjoyed cult status in graphic design circles and were frequently used for backing up hard disks. The 100MB (later 250MB and 750MB) capacity served its purpose until relatively recently, when hard disks became cheaper and files became bigger. The JAZZ format made a fleeting appearance, but failed to recapture the market like the ZIP.

Iomega released the most recent update to the line in 2004, called REV, with revamped capacities more suited to current storage demands. REV disks are primarily designed for backup, yet they are equally useful for moving large amounts of data around and will be extremely handy for multimedia content creators, including video editors and graphic designers. USB 2.0 (\$699) and ATAPI (\$679) versions were launched first, with SCSI (\$849) and FireWire (\$699) following later in the year, and now a Serial ATA model. The bundled software supports

Windows XP, 2000 and Server 2003, but only the external version adds Mac OS X compatibility.

The 3.5in internal drive employs the Serial ATA interface, meaning you'll need a current-generation motherboard and processor to drive the hardware. Each disk is designed to hold 35GB of uncompressed data, with a claimed 2.6:1 compression ratio at the highest setting equating to a 90GB storage capacity. REV disks retail for \$99, equating to a backup cost of \$1.10 per gigabyte.

The device ships with Iomega REV System Software, Iomega Automatic Backup Pro for scheduling backups (which includes AES-based encryption), Iomega Boot and Run software designed for disaster recovery, and a REV-compatible version of Norton Ghost. APC Labs measured a blisteringly fast sustained transfer rate of 23.4MB/s. Given that most users back up data in their downtime, this figure will be of greater interest to those people using the disks for transporting information from A to B. An Autoloader can be added for \$3,999.

At \$649, the Iomega REV isn't cheap, but it's more convenient than DVDs and good value compared with other industrial-level storage devices, like tape.

Matthew Overington

Details

Contact	Iomega
Phone	(02) 8875 7851
Online	www.iomega-asia.com
Price	\$649; disks, \$99
Intended market	Small business/everyone
✓	Flexible; fast; efficient.
✗	Only ships with Windows support.
Verdict	★★★★★

Registry Mechanic 4.0

Feature improvements make this handy utility worth the upgrade.

Sometimes you can buy a version upgrade and barely spot the differences. You can't miss them with version 4.0 of Registry Mechanic, a registry cleaner from Australian software house PC Tools.

Previous versions of the app looked like something designed for Windows 95, or a free Web utility — its interface didn't do it justice. But Registry Mechanic 4's redesigned interface makes the software look like a true Windows XP program, and it's almost idiot-proof, with a more logical arrangement of the options.

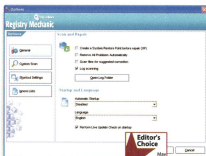
But significant surgery has also been performed on the program itself, speeding up operations with a revised scanning algorithm. It provides options for a deep scan and a quick scan, the latter finding and fixing obvious problems such as invalid file/folder references, problem hardware drivers and orphaned startup programs in seconds. If you install and uninstall dozens of programs each week, you'd probably run quick scans every few days and the deep scan weekly. Registry Mechanic 4's custom scan feature lets users be selective

about which errors the program should look for and repair, while the Ignore Lists function enables selected registry values and keys to be completely overlooked.

After a scan, Registry Mechanic brings up a results screen with problems and suggested corrections. By right-clicking on each, you're given the option of executing various actions on the offending value or sub-key, ranging from deletion to replacement with another value. In the latter, Registry Mechanic scans the \Windows and \Program Files directories on your system and suggests corrections to values containing invalid links to files. You can also directly edit a value or sub-key if necessary. Other invaluable new features include the automatic creation of registry backups and the option of setting a system restore point before any changes are made.

There's also a Live Update feature, which automatically checks for any updates to the program and downloads them. This wouldn't be needed as often as it would in an antivirus program, but it's all part of the new slick feel of Registry Mechanic.

Tony Sarno



Details

Contact	PC Tools
Phone	(02) 8966 2950
Online	www.pctools.com
Price	\$29.95
Intended market	Everyone
	Powerful yet simple; customisable error checking; automatic registry backups; live update.
	Very specialised; only fixes registry.
Verdict	★★★★★

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Sitecom USB 2.0 Universal Dock

A clever solution for notebooks makes life easier for desktop pit stops.

While notebooks are great on the road, the limited number of connection options can make desktop setups a chore. Docking stations are readily available for popular notebooks, but can be hard to find if you've got an older model or obscure brand. Sitecom offers a number of products to provide USB docking solutions for notebook (and desktop) users.

Sitecom's USB 2.0 Universal Dock provides a flexible wiring solution for desktops and an all-in-one connection for mobile users. Relying on the USB 2.0 ports found on most modern machines, three models are available: a basic USB dock; one with USB ports and a 10/100 Ethernet connection; and another that offers Ethernet and a video connector.

The latter gives a 10/100Mbit/s network link, three extra USB connections, keyboard, mouse, VGA monitor and a serial connection, all managed through a single USB 2.0 connection to a PC. Be aware that — due to the bandwidth limitations — you won't get the same performance from a monitor through the shared USB channel as you would if it was directly plugged into the graphics

card. However, the VGA connection can be used to extend your desktop over a second monitor.

One of the best features of the dock is its portability. It weighs about 450g including connectors and power supply, and has a footprint of around 13.5 x 7.5cm.

A clear diagram of the connections is printed on its black and silver case, so once the dock's set up you can switch your devices around without crawling around the back of the system. Installation is easy, requiring one reboot and a quick scan over the nine pages of setup instructions. You must have Windows 2000/XP to use the installation CD, but Sitecom's Web site indicates that drivers for Windows 98 SE and Me are on the way.

This solution fits a niche and is a useful device for anyone who spends a lot of time running a desktop-tethered notebook. It's also great for those running PCs with spaghetti-like cable setups, as it can serve adequately as a hub. The only real limitation is the lack of video performance, but considering that most notebooks come with a VGA port, this is only a concern if you're looking for stellar results from a second display.

Jude Hungerford



Details

Contact	Anyware
Phone	(02) 9879 5788
Online	www.anyware.com.au
Price	\$115; LAN, \$129; LAN and VGA, \$195
Intended market	Everyone
✓	Inexpensive, convenient extender.
✗	Poor video performance.
Verdict	★★★★☆

XpertVision Nvidia GeForce 6200

This budget video card achieves a nice balance between price and performance.

The GeForce 6200 range is the entry-level product line from Nvidia, designed to bring some of the feature sets of more expensive GPUs into the mainstream market. It's the cheapest GPU to support DirectX 9, OpenGL 1.5 and Shader Model 3.0 (part of the CineFX 3.0 engine), for instance, and it sports an internal clock speed of 300MHz, four pixel rendering pipelines, 128MB DDR RAM (128-bit interface) and is PCI Express ready.

With VGA, DVI and S-Video outputs, this card supports HDTV at resolutions up to 1,920 x 1,080i, and features MPEG-2 and WMV-HD hardware acceleration, making it a good choice for video playback. It will fit in a standard desktop and is cooled by a 3in onboard fan that draws power from the bus. XpertVision has bundled the card with CyberLink PowerDVD 5, Chaser (a game), and an S-Video- to-component/S-Video/analog converter.

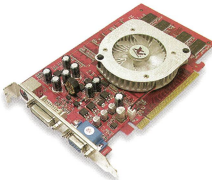
The 6200 was put through its paces with 3DMark2001 Pro SE, 3DMark03 and the Halo and Doom 3 timedemos on a Pentium 4 3GHz, 1GB PC3200 RAM, Intel 915G/ICH6 motherboard and version 66.93 Nvidia drivers. The card didn't produce

blistering performance on any setting, just managing 8,858 at 1,024 x 768 in 3DMark2001 Pro SE with no filtering applied. It can handle some basic gaming, though it can't cope with applied visual effects very well. With only four rendering pipelines, high detail games like Doom 3 are too affected by rendering lag for enjoyable play.

Although the card supports filtering technologies such as Intellisample 3.0 and UltraShadow II, the same can't be said for sampling compression. Its inability to perform at all in the 3DMark03 test demonstrates that even though it supports DirectX 9 natively, it doesn't have the grunt to pull it off. Even the DirectX 8 tests in 3DMark2001 Pro SE pushed the card to its limits.

XpertVision's GeForce 6200 offers basic gaming and 3D performance, especially for games without intense 3D engines. Those who want acceptable resolutions above 1,024 x 768 will have to look elsewhere. However, with all the standard outputs and HDTV support this card would be a sound purchase for a high-end workstation, multi-display system or Media Center-equipped machine, especially given that the bundle contents lean in that direction and the card is PCI Express-based.

James Bannan



Details

Contact	Altech Computers
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	\$187
Intended market	Everyone
✓	Reasonable performance; good features.
✗	Can't support advanced features in real time.
Verdict	★★★★☆

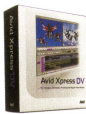


Blockbuster magic, now showing on a small screen near you.

Avid Xpress DV, now pre-loaded with HP Workstation xw4200. Think real-time Special FX and one name literally edits out the drag of a boring video clip. Avid – for years, Hollywood's preferred partner in digital video editing. Cut to right here, right now; a time and place when Avid Xpress DV's astounding capabilities are being exclusively pre-loaded with the HP Workstation xw4200. Not only for use in Hollywood, but your homes and workplaces. Think about it. Avid's coming home to transform your lacklustre video editing project into an experience that's as thrilling as a Hollywood blockbuster.

So, why is HP teaming up with Avid? Well, Avid's real-time FX need the unrivalled power and stability of the HP Workstation xw4200. The workstation provides ultra-smooth processing with Intel's® Performance Acceleration Technology and nVidia's 3D graphics, as well as increased application uptime with Error Checking and Correction (ECC) memory. That's why HP is the only certified hardware partner for Avid's high-end editing solutions. Which include Avid DS Nitris, Avid MediaComposer Adrenaline, Avid Xpress Studio and Avid Xpress Pro HD.

Come, touch and feel video editing hardware and software that's great for homes and small businesses. You'll discover how the HP-Avid partnership keeps technology out of your hair, setting your creative juices free to pursue that elusive award – courtesy of the Academy. Or otherwise.



Avid Xpress DV Editing software

- 100+ customisable real-time effects
- One-step Auto Correct colour correction
- Award-winning user interface
- Upgradeable and 100% compatible with the entire family of Avid editing

Retail packaging is for placement only. Software comes pre-loaded.



HP WORKSTATION XW4200 and Avid Express DV

\$1,999

- Intel® Pentium® 4 Processor 3.20GHz
- 1GB (2x512) DDR2 RAM
- 80GB SATA 7200rpm hard drive
- NVIDIA Quadro FX540 128MB PCI-E
- 16x DVD+-RW Dual Layer
- Workstation Part Number PT212PC#ABG
- L1955 19" Flat panel Monitor for just \$999. Part Number FH460A4#ABG

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www.hp.com.au/workstation

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www.avidaustralia.com.au/xpressdv



Hit the shops

Stay on top of product releases with APC's monthly run-down of the best of the best.

With gaming now generating more revenue than Hollywood, major vendors have realised there's big money in catering to the bleeding-edge market. Until recently, those looking for a PC with blistering performance had little choice but to either consult a specialist box builder, or do the dirty work of sourcing the components and building the systems themselves.

However, Dell has just started to offer Dimension XPS gaming rigs locally. These are designed to showcase the best new Intel technology and offer a viable alternative to building your own performance machine.

If you're a purist who can't stand the thought of letting someone else build up your pride and joy, ASUS' formidable A8N-SLI Deluxe motherboard has proved a big winner on all fronts — bundled features, software and performance. And if you're building a performance PC, what better way to start than by coupling the board with AMD's flagship desktop processor? At around \$1,400, the Athlon FX-55 is expensive, but Ferrari processing performance doesn't come cheap. When combined with a pair of Maxtor's DiamondMax 10 hard disks (each featuring a 16MB cache and support for Native Command Queuing), PowerColor's Radeon X850XT PE and 1GB of DDR2 SDRAM, you're well on your way to building up the most drool-worthy desktop money can buy. After all, that's what Best Buys is all about.

Processor/motherboard

ASUS A8N-SLI Deluxe/ AMD Athlon FX-55



Details

Contact Achivia
Phone (02) 9742 3288
Online www.achivia.com.au

Price Motherboard, \$299;
processor, approx. \$1,400

ASUS' A8N-SLI Deluxe offers great performance, SLI capabilities, three PCI slots and support for eight SATA II drives using onboard NVRAID. Audio includes onboard digital and optical S/PDIF outputs; the two Gigabit Ethernet ports have ASUS' AI NET 2 cable fault technology enabled.

The software package includes Nvidia nTune and Firewall, ASUS PC-Probe and AI Booster, Norton Internet Security 2005, Winbond Voice Editor, and InterVideo WinDVD. Add AMD's Athlon FX-55 processor, and you've got a super-fast solution.

ASUS A7N8X-E/AMD Sempron 2600+

AMD's entry-level Sempron processors offer a 333MHz FSB and 256KB of Level 2 cache.

Enhanced Virus Protection is built in and enabled by Windows XP. Combine the chip with an ASUS A7N8X-E Deluxe motherboard for a powerful, low-cost base platform.

Details

Contact Achivia
Phone (02) 9742 3288
Online www.achivia.com.au
Price Motherboard, \$200;
processor, \$130



Desktop systems

Dell Dimension XPS



Based on the i925XE chipset, Dell's Dimension XPS gaming system offers full support

for Pentium 4 Extreme Edition processors. The \$2,297 base model includes a 3.4GHz Pentium 4 processor, 512MB of dual-channel DDR2 SDRAM, 80GB SATA hard disk, 4x CD-RW/DVD combo drive, SoundBlaster Audigy 2 ZS, 128MB Radeon X300 video card and Windows XP Home — but no monitor.

Details

Contact Dell
Phone 1300 303 107
Online www.dell.com.au
Price \$2,297

Upgrading to an ATI Radeon

X850PE video card costs an additional \$498.30, but it brings outstanding gaming performance.

Optima WorkPro D9S



The Optima WorkPro D9S is an excellent performer, has an extensive software suite and three-year warranty. It employs a

3.2GHz Pentium 4 processor, 120GB Seagate hard disk, 1GB of dual-channel DDR RAM, Double Layer DVD burner, 19in TFT display and a TPM chip for added security.

Details

Contact Optima
Phone (02) 9701 3777
Online www.optima.com.au
Price \$2,000



Notebooks

Dell Inspiron 700m



The Inspiron 700m notebook from Dell has an uncanny mix of performance, features and battery life, without cutting any significant corners in the process.

Inside the case throbs a 1.8GHz Pentium M, 1GB of DDR RAM, 80GB drive, DVD-RW burner and Dell's own 802.11a/b/g wireless. The 12.1in screen runs at the same 1,280 x 800

wide-screen resolution as found in many other ultraportable systems, but its glossy coat gives it extra clarity and brightness.

Details

Contact Dell
Phone 1300 303 107
Online www.dell.com.au
Price \$2,920.60

The 1.9kg system features an 8-cell battery and manages to run for over four hours. The only letdown is a light software suite, but the low asking price sweetens the deal.

Acer Aspire 1690



The Acer Aspire 1690 features a 1.6GHz Pentium M processor, a 15in wide-screen display running at 1,280 x 800 pixels, Double Layer DVD±RW drive and 60GB hard disk. The base RAM is meagre at 256MB, but you can always add more. At around 3kg, this machine doesn't feel like dead weight.

Details

Contact Acer
Phone www.acer.com.au
Online 1300 366 567
Price \$2,699

Digital cameras

Nikon D70



The 600g Nikon D70 offers a 6.1 megapixel CCD and 0.13 second shutter response time. It features a Nikkor F mount which accepts a wide range of Nikon lenses, including regular G or D AF-type SLR lenses. The 18–70mm lens bundled with the camera offers aperture ranges from f/3.5 to f/4.5.

The camera resembles an SLR and offers the same range of settings. Users have a choice of fully automatic or a range of scene modes. Bracketing and a selection of shooting modes are supported, including single frame, 3fps and a self-timer.

Details

Contact	Maxwell
Phone	(02) 8748 5200
Online	www.maxwell.com.au
Price	Body, \$1,999; D70/AF-S with 18–70mm DX lens, \$2,299

Olympus Camedia C-5060

The 5.1 megapixel C-5060 is hard to go past. The 27–110mm 4x zoom lens offers a wide-angle and a super macro mode, and it's reasonably fast with an f/2.8 to f/4.8 aperture. A variety of shot, meter, focus, white balance, exposure and image file modes are also available.

Details

Contact	Olympus
Phone	1300 659 678
Online	www.olympus.com.au
Price	\$1,099

ADSL modem/routers

DrayTek Vigor2600G



One of the most feature-rich ADSL modem routers on the market, the Vigor2600G is primed for business. The device supports up to 16 simultaneous PPTP, IPsec and L2TP VPN connections using DES, 3DES or AES encryption schemes, making it compatible with most enterprise firewalls. SNMP support is also included, along with Dynamic DNS, DMZ, VLAN, RADIUS support, SSID hiding, 128-bit WEP and WPA support.

Rounding out the feature pool is 54Mbit/s Wi-Fi, making the DrayTek modem router a complete solution for getting your wireless, Internet-enabled home network up and running securely.



Details

Contact	DrayTek Australia
Phone	1800 617 711
Online	www.draytek.com.au
Price	\$349

Belkin F5D7630au4A

The F5D7630au4A is one of the best value all-in-one routers available today. Superb out-of-the-box functionality, SSID hiding, WPA-PSK and 128-bit WEP wireless security features are all offered. Sadly, there's no print server capability or line filter in the retail box.

Details

Contact	Belkin
Phone	1800 666 040
Online	www.belkin.com.au
Price	\$300

UPDATED TFT screens

Mitsubishi DiamondPoint UX21



Mitsubishi's DiamondPoint UX21 LCD achieves some of the best colour accuracy test results of any monitor through the APC Labs thus far. The sleek 21.3in black unit boasts a thin bezel, native resolution of 1,600 x 1,200 pixels, 20ms response time, brightness rating of 250cd/m², and support for dual inputs (one analog, one digital).

The stand includes a swivel and height-adjustable base. The screen itself is hinged-mounted, can be rotated between portrait and landscape modes.

It has a wide viewing angle and lengthy warranty. The only letdown is the dead pixel policy: replacement for a maximum of six bright dots, 10 black dots or 10 total defects.

Details

Contact	Mitsubishi Electric
Phone	(02) 9684 7777
Online	www.mitsubishielecric.com.au
Price	\$2,295

Samsung SyncMaster 913N



Samsung's latest 19in TFT panel sets the standard for PC displays. The 8ms pixel response time, 1,280 x 1,024 resolution and thin bezel make a top all-rounder. A wide range of options for inputs and stands, and an excellent dead pixel policy makes it even more attractive.

Details

Contact	Samsung
Phone	1300 369 600
Online	www.samsung.com.au
Price	\$999

Handhelds

palmOne Treo 650 smartphone



PalmOne's 180g Treo 650 is a stellar follow-up to the Treo 600. It can now communicate directly with an Exchange server to send and receive email on the road, and POP/IMAP integration is also included. Palm OS 5.4 drives a VGA resolution camera and 320 x 320 pixel backlit TFT display that remains clear and bright during outdoor operation.

Non-volatile RAM means that the device can retain data after powering down, though it comes at the cost of some storage space. A few stylistic changes, like a curved keyboard and Bluetooth support, also bolster the 650 as a worthy upgrade from its predecessor.

Details

Contact	palmOne
Phone	(02) 9844 5420
Online	www.palmone.com.au
Price	\$1,199

Dell Axim X30 Basic



Designed for the first-time or light PDA user, the X30 Basic is good value. The Intel XScale 312MHz processor is adequate, while the 32MB of user-accessible memory is plenty for PIM use and a few apps. The SDIO slot can be used to add Wi-Fi, Bluetooth or more storage.

Details

Contact	Dell
Phone	www.dell.com.au
Online	1300 303 107
Price	\$399

External hard disks

Maxtor OneTouch II USB



Quite simply, a PC can never have enough storage, so adding an external drive is the perfect way to increase capacity or facilitate the transfer of huge files. Maxtor's OneTouch II USB impresses with its supplied backup software which can copy precious data to the drive with a single press of a button. Performance is stunning, and the drive is available in capacities up to 300GB.

The Maxtor is solidly built for a portable device, so little accidents shouldn't cause problems. And if you require more than one, the cleverly inverted patterns on the drive's top and bottom let you stack them safely.

Details	
Contact	Maxtor
Phone	(02) 9369 3662
Online	www.maxtor.com
Price	300GB, \$449

Seagate 5GB Pocket Drive



Sometimes portability outweighs the convenience of having hundreds of gigabytes of storage space in an external drive.

Advances in miniature hard disks have led to Seagate's impressive 5GB Pocket Drive. The entire USB 2.0 unit measures 7cm in diameter so you can take it almost anywhere.

Details	
Contact	Ingram Micro
Phone	(02) 9701 4500
Online	www.seagate-asia.com
Price	\$349

Internal hard disks

Maxtor DiamondMax 10 SATA



Maxtor's DiamondMax 10 line is the current performance leader for mainstream desktop drives. Each drive features a 16MB cache, 7,200rpm platter speed and support for Native Command Queuing (NCQ). NCQ allows the system to organise, and read and write on certain areas of the disk, reducing the seek time and optimising the path of the drive's read head.



Though NCQ isn't supported by older chipsets, anyone running an Intel 9xx-based or Nvidia nForce4 motherboard can take advantage of the server-grade technology. Gamers, video editors and performance enthusiasts will benefit most from this line, which allows users to build inexpensive, fast disk systems for mainstream desktops.

Details	
Contact	Maxtor
Phone	(02) 9369 3662
Online	www.maxtor.com.au
Price	250GB: \$239; 300GB: \$299

Western Digital WD1600JB



If you're lagging behind and haven't opted for a system with support for Serial ATA drives yet, the best bet for adding extra storage to your machine is a Western Digital IDE drive. The JB line includes an 8MB cache, which speeds burst transfers of data, backed by a three-year warranty.

Details	
Contact	Weston
Phone	(03) 9541 8888
Online	www.weston.com.au
Price	160GB, \$189

Optical drives

Sony DRU720A



The DRU720A from Sony is the new speed king in the APC Labs, capable of burning DVD+R media at 16x, DVD-Rs at 12x and Double Layer discs at 4x. Beating the previous incumbent, the Pioneer DVR-A08XL drive, by a full minute, the DRU720A burned a test disc in five minutes and 47 seconds. CD-R writing is supported at 48x, writing a full disc in two minutes and 53 seconds, and CD-RW at 24x.



The small size means those with tight-fitting cases will have more room. Bundled with Ahead Nero 6.0 OEM, a replacement black face plate and an IDE cable, the DRU720A is both fast and well appointed, making it ideal for backups.

Details	
Contact	Sony
Phone	1300 138 246
Online	www.sony.com.au
Price	\$179

Samsung TS-H492A



The CD-RW is still a hot commodity at the budget end of the market. The TS-H492A combines a 52x CD-R, 32x CD-RW drive with a 16x DVD-ROM for "best of both worlds" performance. It also has Ahead's Nero 6.0 for burning CDs and CyberLink's PowerDVD 6.0 for watching movies.

Details	
Contact	Samsung
Phone	1300 369 600
Online	www.samsung.com.au
Price	\$99

Printers

Konica Minolta magicolor 2400W



Konica Minolta's new magicolor 2400W is currently pegged as the smallest four-pass colour laser printer on the market.



With a rated speed of 5ppm for colour and 20ppm for monochrome prints and a duty cycle of 35,000 pages per month, it's ideal for any small business.

Though the output can't match the quality of more expensive models, the low cost of operation and price tag are compelling, especially where one eye is always on the bottom line. That said, the

2400 x 600dpi device is capable of outputting colour photos and is ideal for high-volume home printing — perfect for a family with school-age kids. This is a great all-round personal laser printer.

Details	
Contact	Konica Minolta
Phone	1800 265 687
Online	www.printer-konicaminolta.com/au
Price	\$799

Brother MFC-620CN



Separate ink tanks, Ethernet support and a maximum print resolution of 6,000 x 1,200dpi makes the 620CN a great choice

for homes and small business workgroups. The printer offers excellent photo prints and a built-in card reader for great all-round flexibility.

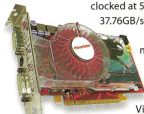
Details	
Contact	Brother
Phone	(02) 9887 4344
Online	www.brother.com.au
Price	\$399

Video cards

PowerColor Radeon X850 XT PE



PowerColor's Radeon X850 XT Platinum Edition features 16 pixel pipelines and six programmable vertex shader pipelines, a 540MHz core clock, with 256MB of GDDR3 RAM clocked at 590MHz. This adds up to a throughput of 37.76GB/s and a fill rate of 8.64 gigapixels per second.



The card is manufactured on a 0.13 micron process and features full DirectX 9.0 and OpenGL 2.0 support, integrating ATI's proprietary SmartShader HD, SmoothVision HD, Hyper Z HD and VideoShader HD technologies. It also ships with a comprehensive software bundle of useful utilities.

With specs like these, expect this card to survive the next wave of game releases.

Details

Contact	Australia IT
Phone	1300 668 715
Online	www.australiainit.com.au
Price	\$945

ABIT Radeon X300 SE-Guru

In this case, the budget price tag doesn't mean low value.

Besides its top performance, ABIT's card stands head and shoulders above the rest of the cards in the X300 range thanks to the inclusion of the company's proprietary vGuru overclocking technology.

Details

Contact	Altech
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	\$154

Blogging software

ExpressionEngine 1.21



ExpressionEngine (EE) is a new release from pMachine, maker of the software behind popular sites iPod Lounge (www.ipodlounge.com) and Gear Live (www.gearlive.com).



EE runs on the PHP/MySQL platform and needs to be installed on a Web server, either one you already have or through a pMachine hosting account.

The main advantages of EE are its modular design and competitive pricing. The included themes aren't great, but they offer a solid base and use modern CSS formatting. There's a steep learning curve, but you'll really appreciate the advanced features.

If you've used other blogging software for six months or more, you're eligible for a discount.

Details

Contact	pMachine, Inc.
Online	www.pmachine.com
Price	Commercial, US\$199.95; Non-commercial, US\$149.95; Competitive upgrade, US\$99.95

Google Blogger

Although it's not as full-featured as TypePad and LiveJournal, Blogger is better value. It allows unlimited blogs/author accounts, and you can upload to your own server or the more anonymous BlogSpot.com. There's a range of designer templates, or you can script your own. Integration with AdSense is a breeze.

Details

Contact	Google
Online	www.blogger.com
Price	Free

NEW category

Photo management software

Adobe Photoshop Elements 3.0



Photoshop Elements has every feature a digital camera enthusiast could want in a neat, stable package. It scans drives for content and files them by date, natively supports most image formats and has an efficient search function. Edits are automatically tracked and multiple versions of a single image can be saved.



Tools to adjust lighting, colour, contrast and sharpness are provided, along with red eye reduction, sharpening, spot healing and cropping features.

Tags can be attached to images, and EXIF Print information is supported. Gallery, PDF and VCD output helps make it easy to share images with friends.

Details

Contact	Adobe
Online	www.adobe.com.au
Price	\$169

Google Picasa 2



A clean, intuitive interface, instantaneous search and integration with the Hello network (www.hello.com) make Picasa 2 a great tool for keeping track of images. It can perform basic touch-ups, burn slideshows to CD or post them to the Web, and allows the user to tag images. A fantastic piece of free software.

Details

Contact	Google
Online	www.picasa.com
Price	Free

NEW category

Security software

Zone Labs ZoneAlarm Security Suite



The Internet is a scary place for an unprotected Windows machine. ZoneAlarm Security Suite is like a whole team of security guards for your PC, offering



identity and privacy protection, instant message content filtering, spam and anti-phishing protection, ZoneAlarm firewall and a complete antivirus solution.

Control over who and what can access your Internet connection and open ports is quick and hassle-free. Use it in conjunction with a spyware detector such as the free Spybot-Search & Destroy (www.safer-networking.org) for total lockdown.

Details

Contact	Secure Tec
Phone	(03) 9755 5314
Online	www.zonelabs.com.au
Price	\$99.95

Sygate Personal Firewall



Your data's worth may be incalculable, but you don't have to spend a cent to protect it thoroughly.

Sygate's Personal Firewall product offers strong control over internal and external access and offers full reporting based on each application's Internet traffic patterns.

Details

Contact	Sygate
Online	www.sygate.com
Price	Free



Sub-2kg wide-screen notebooks

How we tested

Each machine went through four benchmarks that mimic real world use.

PCMark04 is a synthetic test that simulates common tasks like file compression and encryption, virus scanning, imaging, processing, Web applications and graphics rendering. Business Winstone 2004 focuses on performance under office apps such as Microsoft Word and Excel. Multimedia Content Creation Winstone 2004 is similar to Business Winstone, but focuses on multimedia apps including Adobe Photoshop, Flash and LightWave. BatteryMark 4 disables all power-saving features, so the test simulates a full workload.

Other factors assessed in each unit's rating included hardware spec, weight/dimensions, screen size/native resolution, multimedia connectivity (including USB, FireWire, card readers, video-out and so on), overall design, bundled software and warranty.

Mix business with pleasure on the road without breaking your back.

Tim Dean warms his lap with six mighty machines.

Today's ultra-portable notebooks combine three key technologies: small and light components; competent feature sets, including built-in optical drives, decent size screens and wireless networking; and longer battery life.

This Labs Challenge focuses on machines weighing less than 2kg, suitable for mobile professionals who might also use the system to listen to a CD or watch a DVD. Wide-screen units with 16:9 aspect ratios are ideal for multimedia presentations as well as entertainment.

SIZE AND WEIGHT

Manufacturers invariably make compromises to keep weight down. This often means omitting infrequently used features, such as serial and parallel ports. Some keyboards have smaller than average keys, while others have unusual key placement to save space. There's no perfect compact keyboard, so it's best to choose one that feels comfortable and has good key placement for your most frequently-used applications.

FEATURES

All the notebooks on test use Windows XP Home as the operating system, except for the Sony VAIO, which uses Windows XP Professional.

In addition to being portable office machines, these PCs can double as entertainment devices. They should include a DVD player and a wide-screen

display with some type of enhancement to protect the eyes, such as a glossy coating or low-glare finish. All the notebooks in this roundup feature wireless networking — 802.11g is strongly recommended to provide the greatest compatibility with networks and hotspots.

POWER PLUS

Although battery technology is continuously improving, the increasing power demands of high-performance processors and features such as bright displays and optical drives means it's always an uphill battle. Most ultra-portables will provide a couple of hours of light work with the supplied (usually four-cell) battery. However, it's worth investing in a high capacity eight-cell or spare battery so you're never caught short.

PERFORMANCE

Small form factor and battery life might be the primary concerns for a business user, but even an ultra-portable needs to be able to handle a broad range of office and multimedia applications.

Each notebook was tested extensively with a range of benchmarks (see "How we tested"). There were some interesting results, with fairly wide variations in performance.

Exceptional performance and long battery life don't always mean a higher purchase price, so it's definitely worth shopping around for the best deal.



Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	\$2,920.60
✓	Excellent screen; fast, good battery life.
✗	Meagre software bundle.
Verdict	★★★★★

Dell Inspiron 700m

Though the Inspiron 700m comes in numerous potential configurations, Dell has got the balance just right for this Labs Challenge. The result is a notebook with an impressive mix of performance, features and battery life without any significant corners being cut.

The distinctive chassis is an interesting combination of metallic and white plastic. Inside the case throbs a 1.8GHz Pentium M — the fastest CPU in this comparison. The processor is backed up by a massive 1GB of DDR RAM. Although 64MB is shared with the graphics system, there is a negligible impact on overall speed — the 700m ranks first in all performance benchmarks.

Other features include an 80GB hard drive (the largest capacity in this roundup), a DVD±RW drive

and 802.11a/b/g wireless capability. The 12.1in wide-screen display runs at the same 1,280 x 800 pixel resolution as many other systems on test, but features a glossy coating which subjectively gives extra clarity and brightness.

Even with all these power-draining features, the 700m still manages a terrific four hours and 15 minutes in BatteryMark 4, thanks to the eight-cell battery supplied with the review model (four-cell is standard). About the only trade-off is weight — at 1.9kg, this is the heaviest unit the roundup. The software bundle is also relatively meagre.

If you're looking for an ultra-portable notebook with a broad range of features, long battery life and swift performance, the Inspiron 700m is hard to go past.

i-Tech Clevo M121W

i-Tech's Clevo M121W has a lot in common with the Pioneer Computers DreamBook (page 62). The 1.8kg chassis is identical except for a difference in finish: the M121W has a metallic look while the Pioneer goes for deep blue glossy plastic. They both have a Webcam and share the same thick lid and bezel around the 12.1in display, as well as a small right-hand Shift key and holes in the palm rest. Another unusual feature shared by these notebooks is the glowing blue scroll button underneath the trackpad — a good addition if you're used to a mouse wheel.

Inside the case is a fast 1.8GHz Pentium M processor along with 512MB of DDR RAM. Despite using a higher frequency processor than the DreamBook, the M121W posted slightly lower scores in both Winstone benchmark tests, though the

differences were only slight. That said, it ranked third under these benchmarks and second in PCMark04 (slightly better than the Pioneer).

The 80GB hard drive is complemented by a DVD±RW optical drive. The M121W is also one of few notebooks on test to sport S-Video output and an IrDA port, though it lacks FireWire or a memory card reader. The software bundle consists only of Roxio Easy CD Creator and DVD Creator 6.

At two hours and 24 minutes, battery life is about average for the four-cell units in this Labs Challenge. Upgrading to the eight-cell battery (\$159) is a better option.

The Clevo M121W has no major flaws though, unless bundled software and battery life are particular priorities.

MSI MEGABOOK S250

The S250 is very much the little brother of the MEGABOOK S260 (see below). While the S260 sports the latest Sonoma chipset, the S250 is a budget outfit consisting of an SiS 661MX chipset coupled to a Mobile Celeron running at 1.4GHz. The Celeron, along with the relatively light 256MB of DDR RAM, account for the S250's below average scores in benchmark tests. The graphics gobble up 64MB of that memory, so it's a good idea to increase RAM to at least 512MB.

The 1.8kg unit also shares its basic chassis with the S260, although where the S260 is iBook-white, the S250 has a slick brushed metallic finish. The 12.1in wide-screen display runs at a resolution of 1,280 x 800 pixels.

MSI MEGABOOK S260

While it has some specs and components in common with the MEGABOOK S250, beneath the surface of the S260 beats a very different heart. Unique to this roundup, the 1.8kg unit is powered by Intel's new generation Centrino architecture, codenamed Sonoma, which comprises a 915GM chipset, Pentium M (Dothan) processor and a PRO/Wireless 2200GB adaptor.

The 915GM chipset adds a 533MHz frontside bus, improved integrated graphics, PCI Express and SATA support, as well as capacity for dual-channel DDR RAM. The Pentium M 730 processor runs at 1.6GHz and uses the full 533MHz frontside bus, although the RAM is single channel and the 60GB hard disk uses IDE rather than SATA. No DVD burner is included.

The other main difference to the S250 is the white styling. The keyboard has a comfortable layout, and the 12.1in screen features a glossy coating for a crystal clear viewing experience.

Performance in application-based benchmarks is limited by the meagre 256MB of RAM. However, by the time you read this the S260 will be available with 512MB. As it stands, it ranks fourth in all application-based tests. The four-cell battery managed two hours and eight minutes — better than the S250, but still the second worst on test. An optional eight-cell battery costs \$269.

Overall, the S260 is a well-rounded package with some excellent features. With an extra 256MB of RAM running in dual-channel mode, it should exhibit a much improved performance.



Details	
Contact	i-Tech
Phone	1800 833 883
Online	www.i-tech.com.au
Price	\$2,099
✓	Decent performance; 80GB hard drive; Webcam.
✗	No FireWire or memory card reader; limited software bundle.
Verdict	★★★★☆



Details	
Contact	MSI Australia
Phone	(02) 9748 0070
Online	www.msicomputer.com.au
Price	\$1,799
✓	Solid chassis; memory card slots.
✗	Ordinary performance; short battery life; no DVD burner; 40GB hard drive.
Verdict	★★★★☆



Details	
Contact	MSI Australia
Phone	(02) 9748 0070
Online	www.msicomputer.com.au
Price	\$2,399
✓	New Sonoma chipset; excellent screen; slick styling.
✗	Only 256MB RAM; no DVD burner.
Verdict	★★★★☆



Details	
Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneercomputers.com.au
Price	\$1,849
✓	Impressive performance and battery life; Webcam.
✗	Design foibles; no memory card reader.
Verdict	★★★★☆



Details	
Contact	Sony
Phone	1300 138 246
Online	www.sony.com.au
Price	\$3,999
✓	Ultra-small; good battery life; excellent screen; software bundle.
✗	Below average performance.
Verdict	★★★★☆

Pioneer Computers DreamBook Slim 120

Pioneer has done an impressive job with this 1.8kg machine. It posts high scores in the benchmark tests (second in the two Winstones and third in PCMark04), as well as ranking second in the grueling BatteryMark test, managing five hours and 15 minutes thanks to the optional eight-cell Lithium-ion battery (\$299).

The DreamBook sports a 1.7GHz Pentium M attached to the 855GME and ICH4-M chipset along with 512MB of RAM, 64MB of which are sacrificed to the integrated Intel Extreme Graphics 2 component.

As mentioned, the DreamBook shares its chassis design with the i-Tech M121W (page 61), including the glowing vertical scroll button at the base of the trackpad, the right-hand Shift key (which has been shrunk to make way for a Windows key), and the

positioning of the latch holes and indented lights right where the palms rest when typing. Another shared feature is the small CMOS Webcam mounted in the lid — facing the user — which is handy for video conferencing.

Features are solid, with a 60GB hard drive and DVD burner, two USB 2.0 ports and optional 802.11b connection, though there's no memory card reader. The software bundle is basic, including Corel Word Perfect Office, CyberLink Power2Go and Roxio Easy CD Creator. The 12.1in wide-screen TFT runs at a default resolution of 1,280 x 800 pixels.

The DreamBook is a well-rounded package with strong performance and long battery life. It's also one of the two units here with a carry bag, the other being the i-Tech.

Sony VAIO VGNT17GPS

The VGNT17GPS is not only one of the more impressive notebooks in this roundup in terms of hardware, it also comes with the most extensive software suite. At its core is Sony's own set of apps, including an image viewer and music player, as well as a nice custom interface — imagine a cross between Windows Media Center and Apple's iLife suite. It's also the only notebook here which comes with Windows XP Professional. However, some will be disappointed that Microsoft Office isn't included.

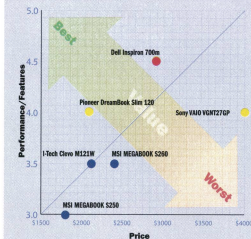
Another standout feature of the VAIO is its tiny size and light weight. At 1.38kg it's around 400g lighter than most notebooks in this Labs Challenge, although the compromise is a smaller 10.6in display. Even so, the screen is one of the best on

test, with 1,280 x 768 resolution and glossy but low-reflective finish.

The VAIO topped the battery life tests at five hours and 35 minutes thanks to its combination of 1.2GHz Ultra Low Voltage Pentium M processor and supplied eight-cell battery. The trade-off is speed, with the unit coming second last in both Winstone benchmark tests and last under PCMark04. Still, it's helped along by a decent 512MB of DDR RAM and attractive features such as Double Layer DVD burner, 60GB hard drive, USB 2.0, FireWire and built-in Wi-Fi and Bluetooth.

Despite its fairly ordinary performance, the VAIO VGNT17GPS's diminutive size and weight combined with the exceptional battery life and software suite make it an excellent choice.

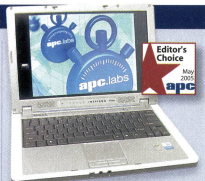
apc price-to-performance ratio



It's not easy to squeeze a powerful PC into a package you can carry around all day. Notebook manufacturers regularly cut corners somewhere to keep things slim, so this Labs Challenge particularly looked for features that may have been omitted, or designs that made too many compromises, such as with keyboard layout.

In the end, the Dell Inspiron 700m was the clear winner: it has superb specs and delivers excellent all-round performance.

Sony's VAIO also deserves credit. While it's not as well-endowed with features or performance as some, its diminutive size and low weight make it



an attractive option for those who regard these as important features.

In terms of value for money, the Pioneer DreamBook is very strong, offering fast performance and plenty of features for under \$2,000.

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Sub-2kg wide-screen notebooks

					★ Editor's Choice	
Manufacturer	MSI MEGABOOK S250	Pioneer Computers DreamBook Slim 120	i-Tech Clevo M121W	MSI MEGABOOK S260	Dell Inspiron 700m	Sony VAIO VGN17G/PS
Price	\$1,799	\$1,849	\$2,099	\$2,399	\$2,920.60 (inc. delivery)	\$3,999
Weight (kg)	1.8	1.8	1.8	1.8	1.9	1.38
Dimensions (WHD, cm)	30.3 x 2.8 x 22.5	29.5 x 2.6 x 23.5	29.5 x 2.6 x 23.5	30.3 x 2.8 x 22.5	29.7 x 3.2 x 21.5	27.2 x 3.4 x 20.5
Screen size (in)	12.1	12.1	12.1	12.1	12.1	10.6
Native resolution (pixels)	1,280 x 800	1,280 x 800	1,280 x 800	1,280 x 800	1,280 x 800	1,280 x 768
CPU	Celeron M 360	Pentium M 735	Pentium M 745	Pentium M 730	Pentium M 745	Pentium M Ultra Low Voltage 753
CPU speed (GHz)	1.4	1.7	1.8	1.6	1.8	1.2
Chipset	SiS 661MX + SiS 963L	Intel 855GME + ICH4-M	Intel 855GME + ICH4-M	Intel 915GM + ICH6	Intel 855GM + ICH4-M	Intel 855GME + ICH4-M
RAM size and speed	256MB DDR	512MB DDR	512MB DDR	256MB DDR	1GB DDR	512MB DDR
Hard disk (GB)	40	60	80	60	80	60
Graphics	Integrated SiS 661MX	Integrated Intel Extreme Graphics 2	Integrated Intel Extreme Graphics 2	Integrated Intel GME 900	Integrated Intel Extreme Graphics 2	Integrated Intel Extreme Graphics 2
Graphics memory	64MB shared	64MB shared	64MB shared	16MB shared	64MB shared	64MB shared
Optical drive	DVD-ROM/CD-RW	DVD-RW	DVD-RW	DVD-ROM/CD-RW	DVD+RW	DVD+RW Double Layer
Operating system	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Home	Windows XP Professional
Modem	56K V.92	56K V.92	56K V.92	56K V.92	56K V.92	56K V.92
LAN	10/100 Ethernet	10/100 Ethernet	10/100 Ethernet	10/100 Ethernet	10/100 Ethernet	10/100 Ethernet
Wi-Fi	MS6833 802.11g MiniPCI	Intel PRO/Wireless 2200BG	Intel PRO/Wireless 2200BG	Intel PRO/Wireless 2200BG	Dell WLAN 1350	Intel PRO/Wireless 2200BG
Bluetooth	✗	✗	✗	✗	✓	✓
IrDA	✗	✓	✓	✗	✗	✗
USB ports	3x USB 2.0	2x USB 2.0	2x USB 2.0	3x USB 2.0	2x USB 2.0	2x USB 2.0
FireWire	4-pin	✗	✗	4-pin	4-pin	4-pin
Video output	VGA	VGA	VGA, S-Video	VGA	VGA, S-Video	VGA
Audio ports	Headphone, mic	Headphone, mic	Headphone, mic	Headphone, mic	Headphone, mic	Headphone, mic
PC card slots	Type I/II	Type I/II	Type I/II	Type I/II	Type I/II	Type I/II
Card reader	MMC, SD, Memory Stick	✗	✗	MMC, SD, Memory Stick	SD	Memory Stick
LCD pixel policy	8 dot (4 bright, 4 dark)	4 pixel triad on/off	5 triad on/off	8 dot (4 bright, 4 dark)	6 pixels on/off	Case by case
Supplied battery	Four-cell	Four-cell	Four-cell (standard), Eight-cell (review model)	Four-cell	Four-cell (standard), Eight-cell (review model)	Eight-cell
Bundled software	Adobe Reader 6, InterVideo WinDVD 4, Ahead Nero Burning ROM 6, Trend Micro PC-cillin 2004	Corel Word Perfect Office, CyberLink Power2Go, Roxio Easy CD Creator	Roxio Easy CD and DVD Creator 6	Adobe Reader 6, InterVideo WinDVD 4, Ahead Nero Burning ROM 6, Trend Micro PC-cillin 2004	Microsoft Office 2003 Basic Edition, CD burning software	Adobe Reader 6, Photoshop Elements 2.0 and Premiere Standard, InterVideo WinDVD 5, Sonic RecordNow! 7, Sony suite, Symantec Norton AntiVirus 2005
Warranty	2-year RTB	1-year onsite	1-year RTB	2-year RTB	1-year onsite	1-year RTB
Carry bag	✗	✓	✓	✗	✗	✗
Extras	✗	Webcam	Webcam	✗	✗	✗
Benchmarks						
PCMark04	2,305	2,795	2,862	2,790	3,022	2,108
Business Winstone 2004	12.1	18.9	17.6	14.8	19.4	14.6
Multimedia Content Creation Winstone 2004	12.6	23.1	21.1	16.3	25.4	16.1
BatteryMark 4	1:44	5:15	2:24	2:08	4:15	5:35



Nvidia nForce4 Ultra and SLI motherboards

Nvidia has followed up its nForce chipsets with a new offering for Athlon 64s. Nick Race checks just how fast they can go.

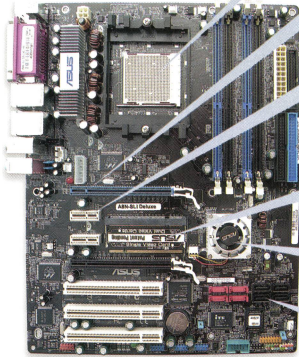
How we tested

An impressive test system was built for an impressive set of motherboards, including an Athlon 64 FX-55 processor equipped with an ABIT X600 PCI Express graphics adaptor, Seagate 120GB Barracuda V SATA hard disk drive, ThermalTake 480W power supply and 1GB of Kingston DDR400 memory. SLI tests were run with two ASUS N6800 GT video cards.

Motherboards were tested for performance using the following benchmarks: PCMark04, 3DMark03, Business Winstone 2004, Multimedia Content Creation Winstone 2004 and SiSoft Sandra 2004 Professional. SLI functionality, where pertinent, was assessed using 3DMark03 SLI. The latest drivers were installed for each board before testing.

The primary considerations in each motherboard's rating were features, connectivity, cooling and noise, as well as bundled software and accessories. SLI capability and test results weren't included in the overall assessment as not all boards have SLI functionality.

Memory timing tests were run at the most aggressive settings of 2-2-2-5, with ATI's Catalyst 5.1 drivers and Windows XP SP2 installed. A fresh installation of SP2 was used for each motherboard test run.



What's onboard?

SOCKET 939

Plug it in: the current standard for desktop AMD CPUs, Socket 939 has extra electrical connections for AMD's HyperTransport bus, allowing it to ramp up to a blazing 1GHz.

PCI EXPRESS X16

PCI Express x16 slots for graphics adaptors provide potential bandwidth increases over the ageing PCI and AGP buses. Running with 16 PCI Express lanes in a single card mode, or eight PCIe lanes when part of an SLI pairing, PCIe x16 is capable of transfer speeds up to 8GB/s.

PCI EXPRESS X1

Expect to see expansion cards for PCIe x1 slots in the near future. Though some x1 cards have been spotted at trade shows around the world, they're yet to hit the shelves. When they do, the faster speeds and non-blocking bus will make the change worthwhile.

SLI SWITCH

SLI boards include a small SODIMM-like slot that allows the board to be configured to work with one or two video cards. When using SLI, the 16 PCIe lanes set aside for graphics are split between two slots.

NVIDIA NFORCE4 CHIP

The nForce4 chip enables PCI Express support for AMD CPUs, built-in RAID, Gigabit Ethernet, Nvidia Firewall, SATA II and more — all in one small slab of silicon.

SATA II

SATA II and NCQ are starting to break down one of the classic bottlenecks of modern desktop computing — slow disk subsystems. With transfers from cache peaking at 375MB/s, using drives with larger caches will see an improvement in speed.

This month, APC compares five motherboards based on Nvidia's nForce4 Ultra or SLI chipsets — among the first to support PCI Express (PCIe) for AMD Athlon processors. Although Intel has offered PCIe motherboard chipsets for more than six months, Athlon 64-based alternatives from Nvidia, VIA and ATI are now arriving.

Nvidia's new chipset comes in three flavours. The basic nForce4 supports a single x16 connector, 20 lanes of PCIe in total, and includes Nvidia Firewall for added protection online.

Next is the nForce4 Ultra — similar to the basic nForce but adds Serial ATA II hardware with peak transfers up to 375MB/s and Native Command Queuing (NCQ) for more efficient hard disk access. Nvidia ActiveArmor — stateful packet inspection (SPI) hardware that takes firewall duties away from the CPU — is also incorporated.

The flagship model is the nForce4 SLI. With two physical PCIe x16 connectors but the same number of actual PCIe lanes, SLI boards can run two

SLI-compatible Nvidia video cards simultaneously, though they operate at x8 by x8 in SLI mode.

As well as Nvidia's PCIe solutions for the Athlon 64, VIA's K8T890 and ATI's Radeon Xpress 200 are now available. All three support Socket 939 processors, DDR memory and HyperTransport links up to 1GHz, as well as an additional RAID controller to the one included with the nForce 4 chipset. Three of the five went with the Silicon Image 3114 chip, enabling additional RAID 0, 1, 5 and 0+1 RAID sets to be created. RAID 5 offers parity and striping over three hard drives, providing the best combination of speed and data protection.

As the memory controller for AMD-based systems reside on the CPU, benchmark results only vary within the margin of error assumed by the benchmarking apps. Results are within 1% of each other and do not indicate superior performance in any board. They therefore meet the required performance metric required for high-end AMD processors. See the table on page 70 for reference.

ASUS A8N-SLI Deluxe

Features The ASUS motherboard's feature set covers most bases. There are two PCIe x1 slots nestled between two PCIe x16 connectors for SLI. (Note: this might block the use of the x1 ports when SLI is in use, depending on the width of the graphics cards chosen.)

Expansion options comprise three PCI slots and support for eight SATA II drives using onboard NVRAID and a Silicon Image 3114 controller. The 3114 chip is connected by PCI and enables RAID 5, which offers the best balance of speed, price and redundancy when linking drives. Two parallel ATA (PATA) ports are included for optical or older disk drives. Two FireWire ports (one internal, one external) plus 10 USB 2.0 ports (four external, six internal) are supported. A 7.1-channel Realtek

ALC850 controller takes care of the audio, and includes onboard coaxial input/output and optical S/PDIF outputs. Two of the Gigabit Ethernet ports have ASUS' AI Net 2 cable fault technology and Nvidia ActiveArmor SPI enabled.

Extras In the box are: two SATA power splitter adaptors; eight SATA cables; two USB PCI slot covers (one with a game port installed); a serial PCI slot cover; IDE cable; floppy cable; external SATA PCI slot cover; and an SLI bridge. The software package includes Nvidia nTune, ASUS PC Probe, ASUS AI Booster, Norton Internet Security 2005, Winbond Voice Editor (for customising voice BIOS error messages), InterVideo WinDVD Suite and Nvidia Firewall.



Details

Contact	Achieva
Phone	(02) 9742 3288
Online	www.achieve.com.au
Price	\$299

✓ RAID 5; excellent features, extras and software package.

✗ May block PCIe x1 ports when using SLI.

Verdict ★★★★★

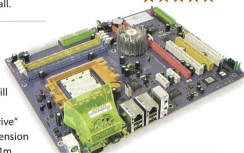
ECS KN1 Extreme

Features There's a single PCIe x16 slot for graphics adaptors plus two PCIe x1 slots, with three PCI slots for expansion. And like the MSI-K8N Diamond, it has six SATA ports.

The KN1's additional SATA connectors are driven by a SIS 180 controller, with no support for RAID 5 (though 0, 1 and 0+1 are available). Still, there are three PATA ports for an additional six drives, versus two on the other boards. Networking connectivity is provided by one Gigabit and one 10/100 Ethernet port. Only 5.1-channel audio is offered through a Realtek ALC655 chipset; though single digital and optical S/PDIF outputs are built in. Ten USB 2.0 connections are available, with four external and six internal headers. Two FireWire connections,

one internal and one external connector will please video enthusiasts.

Extras Of most interest is a USB "thumb drive" 802.11g Wi-Fi adaptor bundled with an extension cable and pedestal for better reception. A 1m Ethernet cable, six SATA cables, SATA power splitters and adaptors, floppy and IDE cable round out the package. A single USB PCI slot cover brings four of the six internal USB headers to the rear of the case, while the remaining two can be routed to case-mounted USB ports. The software bundle includes InterVideo WinCinema and ShowShifter, both great software packages for multimedia and PVR, as well as Wasay DPU, MediaRing Client, Pro. Magic Plus Lite and I'm InTouch (for remote access).



Details

Contact	Protac
Phone	(02) 8748 8888
Online	www.protac.com.au
Price	\$229

✓ TV recording software; Wi-Fi.

✗ Only 5.1 audio; no RAID 5.

Verdict ★★★★★

Dual card graphics

Now that SLI is the new pinnacle for 3D graphics performance, implementation of SLI support is a big deal. Nvidia (which created the SLI spec for use with its video cards) has already made the SLI solution for Socket 939 available, and an nForce for the Pentium is lined up for later this year.

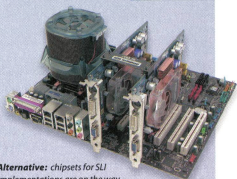
VIA's K8T890Pro solutions support SLI video card links, dubbed VIA DualGFX Express. However, the board has yet to go into mass production. ATI is also coming to the party, with the "RD-400" dual video card solution, spotted at Germany's CeBit in March.

Gigabyte's attempt at an SLI board for Intel processor platforms has also turned up. Using the i915P chipset, the

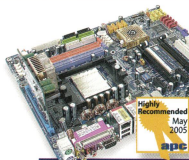
GA-8I915P-SLI board has two x16 slots, one with 16 lanes of PCIe and another using the four spare PCIe lanes (for the 915's total of 20) for the second card. This should work, considering the relatively small amount of PCIe bandwidth taken up using current hardware.

Gigabyte's strategy is questionable for a few reasons. Firstly, 915P-based motherboards aren't that much cheaper than nForce boards, so potential savings are relatively small. Secondly, all other components on the board are connected via the PCI bus, so while the graphics implementation might be lightning fast, Gigabit Ethernet and PCI-connected cards will run as slow as pre-PCIe motherboards. Rather than a genuine

competitor to Nvidia and VIA SLI solutions, the i915P SLI seems to be a rather elaborate proof-of-concept.



Alternative: chipsets for SLI implementations are on the way.



Gigabyte K8NXP-SLI

Features

This is one of the three SLI-capable cards in this Labs Challenge, providing two x16 and two x1 PCIe connectors, though one of the x1 connectors may be obscured if the SLI capability is implemented. Two PCI slots feature, plus support for eight SATA drives. A Silicon Image 3114 RAID chip provides RAID 0, 1, 0+1 and RAID 5 functionality in addition to the nForce platform's proprietary NVRAID functionality. Two SATA ports are present for use with older disk drives and optical drives.

Gigabyte's large add-on Dual Power System (DPS) voltage regulation module provides power to the board in six phases, and is designed to make the system more stable should the PSU output "dirty" power.

Audio is catered for by a Realtek ALC850 7.1 chip driving a coaxial S/PDIF input/output connector, plus four stereo outs for a 7.1-channel system. Two Gigabit Ethernet connectors are offered, both protected by Nvidia's ActiveArmor. The standard 10 USB 2.0 ports (four external, six internal) complement the three FireWire 800 ports.

Extras The real highlight is a PCI 802.11b/g card for Wi-Fi connections. Eight SATA cables, four SATA power converters, floppy, IDE cables and an SLI bridge are provided for connectivity. The software bundle is solid, though there's not a lot to get excited about: Norton Internet Security 2005, Nvidia Firewall, Gigabyte Download Centre, EasyTune 5 and X-Press Recovery are included.

Details

Contact	Rectron
Phone	(03) 9561 6166
Online	www.rectron.com.au
Price	\$349

✓ Wi-Fi; RAID 5; FireWire 800.

✗ Average software package.

Verdict ★★★★★



MSI K8N Diamond SLI

Features The K8N Diamond's specs are a little disappointing: it offers just two x16 slots for SLI but no other PCIe options.

The second x16 slot can be used for PCIe x1 or x2 add-on cards if a single video card is used, but when both slots are taken up, there's no room for PCIe expansion. There are three PCI slots, with one specially-coloured and tagged "communications optimized" for the included network expansion module.

This module includes Bluetooth and 802.11g connectivity (a board without the add-on is available for \$399). There are six SATA ports in total, four operating off the nForce chipset, and two using a PCIe connected Silicon Image 3132 chip. There's no support for RAID on the 3132, though it

supports SATA II and PCIe boosts its performance. If RAID 5 doesn't appeal, the six high-speed SATA II connectors might. The impressive 24-bit on-chip version of the Creative SoundBlaster Live! takes care of the audio. It supports 7.1-channel, as well as coaxial S/PDIF input/output and optical output. Ten USB 2.0 connections are available, as well as four external ports and six internal USB headers. FireWire (one external port, two internal headers) is also included.

Extras There's a single SATA cable, power splitter, a rounded IDE and floppy cable, plus an antenna for Wi-Fi and Bluetooth reception. MSI's D-Bracket II USB and BIOS error code display round out the package. On CD, software includes MSI's Live Update, E-Color 3Deep and Trend Micro's PC-cillin 2004.

Contact	MSI Computers Australia
Phone	(02) 9748 0070
Online	www.msi.computer.com.au
Price	\$479

✓ Bluetooth; Wi-Fi; SoundBlaster Live!

✗ No separate x1 connectors; no RAID 5; meagre extras

Verdict ★★★★★



MSI K8N Neo4 Platinum

Features This board's PCIe slots are unusually configured. There's one single PCIe x1 slot, but the other is split off into

two PCIe x2 channels, routed to an open-ended PCIe x4 slot. According to a spokesperson for MSI Australia, the intent was to use the open-ended slot to hold a graphics card and run two in SLI configuration using x16/x2 instead of the x8/x8 channel ratio. MSI says it no longer touts the Neo4 Platinum as an SLI solution, leaving the board with a strange layout and a PCIe connector that doesn't meet official specs.

The second slot can still be used for an additional graphics adaptor, enabling dual, triple or four screen displays; though no SLI functionality. Beyond that, the Neo4 has a hefty four PCI slots

and eight SATA ports, four supporting SATA II and four using the Silicon Image 3114 chip for RAID 5 functionality. There are two FireWire ports (one internal, one external) and 10 USB 2.0 connectors (four external and six internal headers). The Realtek ALC850 provides 7.1 audio with one coaxial S/PDIF input/output plus an optical output in addition to the four stereo outputs for 7.1 speaker systems. Two Gigabit Ethernet ports protected with Nvidia ActiveArmor are present.

Extras Two SATA cables, a SATA power adaptor splitter, a rounded IDE cable and floppy cable are your lot for cables. MSI's D-Bracket II is included for external USB ports and BIOS error reporting. The software bundle is identical to the K8N Diamond SLI (above).

Contact	MSI Computers Australia
Phone	(02) 9748 0070
Online	www.msi.computer.com.au
Price	\$309

✓ RAID 5; excellent performance.

✗ Scant cable and software bundle.

Verdict ★★★★★



Want your business to be more efficient? Put on a 24hr a day manager.

Making your business run more efficiently can often mean finding better ways to bring your people together. By employing an HP ProLiant server, powered by Intel® processors, your staff can easily share documents, internet, databases, software applications, printers and communicate via email.

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A great entry level, single processor server, ideal for small business or home office.

\$1,495

- Intel® Pentium® 4 Processor 3GHz
- 256MB RAM
- 36GB Ultra320 15K Hard Disk Drive
- 1 year limited warranty
- Part Number 391011-011



HP ProLiant ML110G2

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\$2,795

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- 1GB RAM
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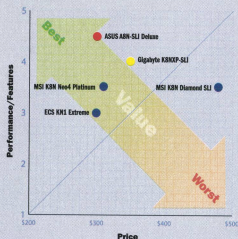
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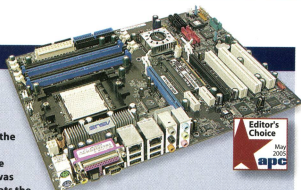


apc price-to-performance ratio



This is a tough one to call because the boards show no calculable difference in terms of performance. However, the variation in the level of accessories and software bundled with the units was surprising. The ASUS beats the others to the line mostly thanks to its comprehensive accessories and extras, though Wi-Fi would make it a killer.

The Gigabyte K8NXP-SLI takes a very close second place. Wi-Fi makes an appearance, and the board's specification and construction are impeccable. However, its software



bundle isn't as complete as that of the ASUS A8N-SLI Deluxe.

The MSI K8N Diamond SLI board has some nice touches, particularly its high-end onboard sound card and support for Wi-Fi and Bluetooth. However, the lack of PCIe x1 or lanes for add-on cards ruled it out of contention.



Nvidia nForce4 Ultra and SLI motherboards

	★ Editor's Choice			
Manufacturer	ECS	ASUS	MSI	Gigabyte
Model	KN1 Extreme	A8N-SLI Deluxe	K8N Neo4 Platinum	K8NXP-SLI
Price	\$229	\$299	\$309	\$349
Chipset	Nvidia nForce4 Ultra	Nvidia nForce4 SLI	Nvidia nForce4 Ultra	Nvidia nForce4 SLI
PCI slots	3	3	4	2
PCI Express x16 slots	1	2	1	2
PCI Express x1 slots	2	2	1/4x (2x)	2
RAM type and number of slots	4x DDR	4x DDR	4x DDR	4x DDR
FireWire/800	2	2	2	3
USB 2.0	10	10	10	10
LAN	1x Gigabit, 1x 10/100	2x Gigabit	2x Gigabit	2x Gigabit
Parallel/Serial	1/1	1/0	1/1	1/1
Audio	Realtek ALC655 5.1	Realtek ALC850 7.1	Realtek ALC850 7.1	Realtek ALC850 7.1
Power connector (20 or 24-pin)	24-pin	24-pin	24-pin	24-pin
Serial ATA	6	8	8	8
Parallel ATA	2	2	2	2
SATA RAID	SIS 180, NVRAID	Silicon 311A, NVRAID	Silicon 311A, NVRAID	Silicon 311A, NVRAID
Bundled software	I'm InTouch, InterVideo WinCinema, MediaRing Client, Pro. Magic Plus Lite, ShowShifter, Wasay DPU	ASUS PC Probe, AI Booster, Cool 'n' Quiet and LiveUpdate, InterVideo WinDVD Suite, Norton Internet Security 2005, Nvidia Firewall and nTune, Winbond Voice Editor	Xtrem Systems X-Setup, MSI Live Update, Trend Micro PC-cillin 2004, E-Color 3DPeep	Easy Tune 5, Gigabyte Download Centre, Norton Internet Security 2005, Nvidia Firewall, X-Press Recovery
Extras (cables)	Ethernet, USB extension, USB 802.11g adaptor, floppy cable, IDE cable, 6x SATA	8x SATA, 1x IDE, 1x floppy, 4x split SATA power, 1x SLI bridge	Floppy, IDE, 2x SATA, SATA power splitter	DPS card, PCI 802.11b/g network adaptor, 8x SATA, 4x SATA power adaptors, floppy, IDE, SLI bridge
PCI slot covers	1x parallel, 1x four-port USB 2.0	1x FireWire, 1x dual-port USB 2.0, 1x dual-port USB 2.0 + Game, 1x Serial	D-Bracket II (USB and BIOS error)	2x USB 2.0, 1x USB 2.0 + FireWire
PCMark04	5,093	5,047	5,099	5,037
3DMark03	4,244	4,250	4,242	4,235
Business Winstone 2004	26.9	27.8	27.1	26.8
Multimedia Content Creation Winstone 2004	36.4	36.3	36.3	36
SiSoft Sandra 2004 Professional	4,935	4,893	4,934	4,872
3DMark03 SLI	N/A	19,480	N/A	18,486

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- Microsoft® Windows XP Home / Professional



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- 24X CD / 24X CD/RW/DVD Combo / 8x DVD +/- RW DL
- 64M DDR 55 / 128M 40/60/80
- 15" TFT LCD XGA(1024x768) / SXGA(1400x1050)
- 5.1 SPDIF Digital Audio with 2 Speakers
- 100/10M Lan, 56K Modem, 1394 Firewire, Wireless Lan
- 3 USB2, PCMCIA, TV Out, Serial Port, Camera
- Microsoft® Windows XP Home / Professional
- Microsoft Office 2003 SEE



Pioneer DreamBook Slim 120

RRP from \$1499

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- Intel PRO/Wireless Network Connection 802.11b/g
- 128M/256M/512M/1G DDR RAM
- 20/40/60/80 GB HD
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- Intel Extreme VGA AC 97 Audio
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- Microsoft® Windows XP Home / Professional
- Microsoft Office 2003 SEE



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PDA phones

How we tested

Each PDA phone was field tested for a minimum of two working days using the same SIM, unless a carrier-specific SIM was required for full phone functionality. Feature set, portability, ease of use and performance were all considered. Those successfully integrating both PDA and phone functions rated highly.

For the startup tests, each phone was powered off, had its battery removed, and was restarted three times. The time taken for the SIM to be read and the phone to be ready for dialling after each restart were recorded and averaged. Talk and standby times are as stated by the manufacturers since actual times depend on usage patterns.

Windows Mobile-based devices were benchmarked using Spb Benchmark 1.0 and the Palm device was tested with Speedy 4.1. Symbian-based devices weren't benchmarked. Results between different platforms aren't comparable.

Can a PDA and mobile phone really combine to make one super gadget? Anthony Caruana road-tests 10 units.

The PDA might have passed the peak of its popularity, but a wave of hype has grown around all-in-one phone/PDA combo handsets.

According to market analyst IDC, shipments of converged devices in Australia reached 66% of the total smart handheld market in the third quarter of 2004, while PDAs without phones declined 13% in the same period.

While some of these hybrid appliances look more like mobile phones with a few extras thrown in, or "smartphones", others more closely resemble PDAs or "PDA phones". This Labs Challenge compares 10 of the latest PDA phones which include either a touchscreen or some form of QWERTY keyboard.

While every device manages to get telephony, mobile Internet and Bluetooth working together, not all include Wi-Fi. All offer at least tri-band capability, with the palmOne Treo 650 and Vodafone BlackBerry 7100v incorporating a quad-band radio. This means they'll work anywhere a GSM service is available (see www.gsmworld.com/roaming/gsminfo for coverage maps). The i-mate PDA2k EVDO and Motorola A1000 use CDMA and a 3G network.

Operating systems aren't often contemplated when buying a mobile phone, but it's a major consideration with these devices. Palm OS fans are limited to the Treo 650. If your preference is for Windows Mobile, there are more choices.

Symbian is becoming increasingly popular, and Palm is reportedly working on a Linux-based version of its operating system.

Two variants of Windows Mobile 2003 are used in the devices here. The more recent Second Edition adds easy toggling between orientations and an improved Web browser. Both versions include Pocket Word and Excel for viewing and editing office documents, but they can lose substantial formatting from the original files when transferring them to a PC.

Before investing in a PDA phone, check that it will sync with your computer. All the devices in this Labs Challenge support connection to Microsoft Outlook and some support Lotus Notes, with the Nokia 9500 Communicator supporting the widest range of PIMs.

It's important to try out a number of different handsets before you buy. Can you operate it with one hand? Will you constantly need to reach for the stylus or is the touchscreen sufficient? Do your fingers comfortably reach all the buttons? Look at the screen and check that the text is suitably large and easy to read. If possible, take the device outdoors into natural light and check the display is still readable.

The units which rated well here successfully integrate the best features and functions of both PDAs and mobile phones without feeling awkward to use.



Details

Contact	Hewlett-Packard
Phone	13 13 47
Online	www.hp.com.au
Price	\$1,299

✓ Wi-Fi; 3.5in touchscreen.

✗ Older version of Windows Mobile; poor battery life; slow.

Verdict ★★★★★

HP iPAQ h6365

HP's first entry into the PDA phone market is a mixed bag. Most of the features are very good, but the 190g unit is relatively heavy and battery life is poor in comparison with the competition.

Connectivity is comprehensive, with Wi-Fi and Bluetooth as well as quad-band GSM and GPRS radio. The h6365 runs the first version of Windows Mobile 2003, consequently missing out on integrated screen rotation and an enhanced Web browser. Given that Second Edition was available at the device's release time, this a significant omission.

A reasonable 57MB of memory is supplied — more than enough for basic PIM and email operations, though not at the top end in this roundup. The 20MB permanent file store can be extended with MMC/SD or SDIO memory cards.

A detachable thumb-board is included to assist with text input, but it only adds bulk to the 13.8 x 7.5 x 2.1cm footprint and is irritating to carry around. Like all the Windows Mobile devices tested, there's a substantial dependence on the stylus for navigation, though it's possible to dial phone numbers using the 3.5in touchscreen.

Performance was disappointing — the Spb result of 754 was one of the lowest ever recorded in the APC Labs. This wasn't surprising considering that the Texas Instruments OMAP processor runs at a mere 266MHz, far lower than the other Windows mobile devices. Restart times were comparable to other devices but the SIM read test was the slowest of all the seven devices on test. Battery life was also poor — 140 hours standby and four hours talk time.

i-mate JAM

The i-mate JAM is almost identical to the Q2 Xda II mini (see page 74). Both share the Intel PXA272 processor, 64MB of memory, 10.8 x 5.8 x 1.8cm footprint and 2.8in screen. While the small size is great in terms of portability, the touchscreen keypad for the phone can be challenging to use. Connectivity options include infra-red, cable and Bluetooth, but no Wi-Fi.

Where the JAM and mini differ is in the bundled software. This Telstra-configured PDA phone includes applications such as KSE Truefax for sending and receiving faxes, plus Telstra's Wireless Modem application, which makes using Bluetooth to connect a laptop to the Internet a breeze. Unlike its sibling, the i-mate PDA2k EVDO (see below), the JAM isn't exclusive to Telstra.

On the downside, the Start menu's text is black and quite difficult to read against the dark blue background of the default Telstra wallpaper. Unless you're looking at the screen face-on, it's practically impossible to read. However, the theme can be changed to something more legible.

The JAM delivered solid battery life, with three hours and 30 minutes of talk time and 190 hours on standby — a full 22 hours more than the PDA2k EVDO. The Spb Benchmark result of 1,244 was respectable — equal second of the appliances tested. Dialling time after restart was towards the low end of the pack, but still reasonable at 38 seconds. The SIM was ready for reading in 64 seconds — the third fastest in this Labs Challenge.



Details

Contact	i-mate
Phone	1300 850 513
Online	www.imate.com
Price	\$999

✓ Compact; simplified Bluetooth setup; fax software; great performance.

✗ Tight button layout; no Wi-Fi.

Verdict ★★★★★

i-mate PDA2k EVDO

Outwardly, the i-mate PDA2k EVDO could pass as a brushed aluminium version of the Q2 Xda IIs (see page 74) — the difference is that it uses Telstra's CDMA and 3G network for Internet connectivity instead of Wi-Fi.

No built-in Wi-Fi means forking out for an SDIO Wi-Fi card if required. A healthy 128MB of memory helps when running multiple programs simultaneously. Extra memory can be added to the permanent file store of 43MB using the MMC/SD/SDIO slot.

Unlike the i-mate JAM (above), the EVDO is only available on Telstra's network. The carrier's branding is evident — the Today screen has a prominent Telstra logo while the toolbars and other screen

elements are customised with a Telstra colour scheme. Thankfully, it can be changed.

Telephone functions are accessible through a button on the front; the keypad is operated via the touchscreen. The built-in keyboard is easy to navigate using the stylus, though the handheld's 210g weight makes it difficult to hold in one hand.

Performance was good, with an excellent Spb Benchmark result of 1,325 and fast restart times. Thanks to the Windows Mobile 2003 Second Edition operating system, the PDA2k EVDO felt quite zippy when running applications. Standby battery life was relatively poor at just 168 hours, though the claimed four hours of talk time is about average.



Details

Contact	i-mate
Phone	1300 850 513
Online	www.imate.com
Price	\$1,399

✓ Lots of memory; 3G mobile; good keyboard and performance.

✗ No Wi-Fi; heavy; lacklustre battery life.

Verdict ★★★★★

Motorola A1000

At just 162g, this PDA phone is lighter than its 11.5 x 5.7 x 1.9 bulk implies. Exclusively distributed in Australia by 3, the A1000 features a tri-band GSM/GPRS radio and W-CDMA. Data connectivity is supplied through 3's 3G services, though the input system is somewhat awkward.

Bluetooth and USB are offered for connection to a desktop PC, but there's no infra-red or Wi-Fi. Uniquely in this roundup, it ships with a Bluetooth headset. The 22MB of available memory can be extended using SanDisk's TransFlash module, located under the battery. Since TransFlash isn't designed to be removed often, this arrangement is reasonable.

Out-of-the-box syncing to Outlook, Lotus Notes and Lotus Organizer negates the need for third party

sync software. The solid software bundle includes the Opera Web browser and Pictsel's viewers for Word, Excel, PowerPoint, PDF and ZIP files.

The Symbian operating system gives the A1000 a great interface and packs plenty of information into the 2.9in touchscreen. However, the handwriting recognition system — Quick Print — isn't intuitive and is really too slow for practical use. The only keyboard is the software option, and the stylus is awkward to remove from its housing and uncomfortable to use.

Battery life was the third lowest of the handhelds in this Labs Challenge, with a rated 170 hours on standby and four hours' talk time. The restart time of one minute and two seconds was the slowest in this roundup.



Details

Contact	3
Phone	13 16 83
Online	www.three.com.au
Price	\$979

✓ 3G connectivity; excellent screen; Bluetooth headset; PIM support.

✗ No Wi-Fi; limited memory; poor character recognition; memory card slot placement.

Verdict ★★★★★



Nokia 9500 Communicator

At 14.8 x 5.7 x 2.4cm and 230g, the Nokia 9500 is a hulking great gadget. That said, it has a great feature set, long battery life and 80MB of memory. And while this is a Symbian device, Microsoft applications are well supported, with Office-compliant word processing, spreadsheet and presentation software.




The 9500 boasts tri-band GSM, GPRS and EDGE for use while on the road, plus Bluetooth and 802.11b Wi-Fi for joining the office WLAN and taking advantage of wireless hotspots. Configuring the different wireless standards is simple — a dialog prompts to select the appropriate network when a connection is attempted.

Opening the 9500 reveals an impressive 4.5in, 640 x 200 display and full QWERTY keyboard with joystick pointer. There's no touchscreen but

the interface is intuitive. The pointing device automatically switches between acting as a mouse and a navigator for the menu system. Four buttons down the right edge provide context-sensitive actions, and a set of eight hotkeys offer quick access to commonly-used applications.

With the case closed, phone operation is identical to most Nokia phones. The directional controller just below the screen is quite sensitive and takes some getting used to — several times the action button was pushed and it reacted as if the up or down function was pressed.

Startup and SIM read times were impressive at 30 and 50 seconds respectively. Battery life was excellent at a rated 300 hours in standby and six hours' talk.

Details	
Contact	Nokia
Phone	1300 366 733
Online	www.nokia.com.au
Price	\$1,499
	Easy connectivity; fax capability; Wi-Fi; impressive battery life.
	Bulky; two-handed operation.
Verdict	



02 Xda II mini

The Xda II mini is aesthetically the polar opposite of the Nokia Communicator (above) — it weighs a tiny 150g and measures just 10.8 x 5.8 x 1.8cm.




The Xda II mini is almost identical in specification to the i-mate JAM (page 73). Desktop connectivity is covered by infra-red, Bluetooth and USB. There's no Wi-Fi, though an SDI/O card can be added through the slot at the top. The mini delivers a handy cache of more than 60MB of available memory plus a supplied 256MB SD memory card.

Windows Mobile 2003 Second Edition is the OS of choice, meaning that in addition to Pocket Office applications, you get ClearVue viewers for PowerPoint and PDFs. PIM functionality is covered with Pocket Outlook and Messaging, providing a basic email client with support for POP3, IMAP and

MMS accounts. Synchronising with a desktop system is limited to Microsoft Outlook.

The mini fits easily in the hand, though the OS is geared towards two-handed operation — one holding the device and the other using the stylus. A cluster of four buttons below the 2.8in touchscreen helps keep the face uncluttered, but they're so close together it's easy to hit the wrong button. The display is clear with good brightness and colour depth.

Powered by Intel's 416MHz PXA 272 processor, the mini was a respectable performer, scoring 1,244 on SpB Benchmark, ranking equal fourth. Its SIM startup times were also among the fastest in this round-up. Battery life was respectable, with 180 hours on standby and five hours of talk time.

Details	
Contact	O2
Phone	(02) 9699 2220
Online	www.seeo2.com
Price	\$1,199
	Compact; clear screen; fast SIM startup.
	Tight button layout; no Wi-Fi.
Verdict	



02 Xda lls

Great specs and a neat interface are packed into the Xda IIs' innovative design, though its 210g weight and relatively poor battery life take some of the shine off when it's used as a phone.

Bluetooth, infra-red and Wi-Fi cover desktop connectivity, and managing the different networks is easy using 02's Wireless Manager. There's plenty of room for data with 128MB of built-in memory and another 43MB of permanent file store, and an SD card can be added if this still isn't enough. Like its smaller cousin, the Xda II mini (above), the IIs runs the Windows Mobile 2003 Second Edition, including the ClearVue viewers for PDFs and PowerPoint.

The highlight is the incorporation of a 3.5in screen and full keyboard in a device measuring

just 12.5 x 7.2 x 1.9cm. It does this with one of the most innovative features the APC Labs team has seen on a PDA: the screen slides up to reveal a full QWERTY keyboard.

The integrated keyboard makes sending email or text messages easy and reduces dependency on the stylus. Pressing the phone button and using the touchscreen to dial numbers makes it possible to use the Xda IIs with one hand, like the Treo 650. The screen's only let-down is a distinct yellow tinge.

Performance was excellent, with an SpB Benchmark score of 1,325, a system startup time of 35 seconds and the second-fastest SIM access time of one minute and two seconds. Given the size of the screen and the 400MHz processor, it was no surprise that battery life was near the bottom of the scale.

Details	
Contact	O2
Phone	(02) 9699 2220
Online	www.seeo2.com
Price	\$1,599
✓	Lots of memory; Wi-Fi; sliding keyboard; fast startup.
✗	Heavy; yellow-tinged screen; poor battery life.
Verdict	★★★★☆

MAY

S M T W T F S S M T W T F S S M T W T F S S M

2 Monday

9.00 am

CALL IN SICK

10.00

TEST DRIVE
THE FERRARI

11.00

Noon

SPEND THE NIGHT
WITH LARA

1.00

2.00

3.00

4.00

5.00 pm

3 Tuesday

9.00 am

Head to PARTS

10.00

for briefing

11.00

Noon



LUNCH WITH LARA

1.00

2.00

BUY PROFESSIONAL
BASKETBALL SQUAD.

3.00

4.00

5.00 pm

(Tue night)

FRENCH RIVIERA

+ OFFSHORE POWERBOATING

4 Wednesday

9.00 am

Call work (not getting any better)

10.00

HEAD TO USA (RIDE POWERCOASTERS)

11.00

Wild West Gun fight
with ruthless outlaws.

Noon

1.00

2.00

3.00

4.00

5.00 pm

TAKE THE HUMMER
OFF ROAD.

KILL VAMPIRES

5 Thursday

9.00 am

10.00

11.00

Noon

1.00

2.00

3.00

4.00

5.00 pm

FLY HELICOPTER

GUN SHIP TO POLAND

TOP SECRET.

Undercover Mission
in RUSSIAALL DAY
Very Important

Meet LARA again

(11.15pm EGYPT)

Friday

9.00 am

CALL WORK (BIT BETTER, BACK ON MONDAY)

10.00

JOIN ELITE COMMANDOS

11.00

+ BOARD SUBMARINE.

Noon

Cancel lunch with LARA

1.00

2.00

3.00

4.00

5.00 pm

GRAND PRIX
RACING WITH THE GUYSMISSION OVER
OCCUPIED FRANCE

(MAY NOT RETURN)

7 Saturday

9.00 am

SPEED THRU
ISTANBUL

10.00

11.00

Noon

1.00

2.00

3.00

4.00

5.00 pm

8 Sunday

9.00 am

ASSASSINATION
(SICILY)

10.00

11.00

Noon

1.00

2.00

3.00

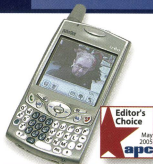
4.00

5.00 pm

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Details

Contact	palmOne
Phone	(02) 9844 5420
Online	www.palmone.com.au
Price	\$1,199

✓	Ergonomic keyboard; long battery life; Mac-compatible.
✗	No Wi-Fi; limited memory; slow SIM read.

Verdict ★★★★★



Details

Contact	Sony Ericsson
Phone	1300 650 050
Online	www.sonyericsson.com.au
Price	\$1,599

✓	Great screen; exceptional battery life; phone usability.
✗	Tight keyboard; no Wi-Fi; limited memory.

Verdict ★★★★★



Details

Contact	Vodafone
Phone	13 26 16
Online	www.vodafone.com.au
Price	\$799

✓	Instant email service; fast startup; PIM support.
✗	No touchscreen; no Wi-Fi; no Bluetooth; limited memory.

Verdict ★★★★★

palmOne Treo 650

Merging PDA and phone functions exceptionally well, the Treo 650 has a great interface and solid battery life. Most connectivity options are covered, a notable omission being Wi-Fi, which can be added via an SDIO card. It's also the only unit here that's Macintosh-compatible.

Built-in storage is limited to 22MB of available memory, expandable with MMC/SD or SDIO. It's not a lot compared with some of the other devices here, and it's not helped by the fact that the Treo stores files in inefficient 512-byte blocks. However, palmOne is reportedly working on a ROM update to alleviate this, and it will only be an issue if you need to carry around a lot of data. A new feature for the Treo is 22MB non-volatile memory, meaning you can remove or swap the battery without losing any data.

While this isn't the smallest or lightest PDA phone in this Labs Challenge, the buttons are well-positioned for single-handed use, and the keyboard and user interface are brilliantly integrated. For instance, in phone mode you can use the touchscreen and keyboard to dial a number.

Battery life was excellent. A power-efficient Intel PXA 270 CPU running at 312MHz resulted in up to six hours' talk and 300 hours on standby. These fantastic figures are equal to the Nokia 9500 and beaten only by the Sony Ericsson P910i. Startup times were less impressive — 55 seconds to dial a number and one minute and 45 seconds to read the SIM card — ranking second to last in the roundup for both tests.

Sony Ericsson P910i

The P910i sits comfortably in the hand, and resembles the communicator in the original *Star Trek* series.

Desktop connectivity is well covered with a cradle, Bluetooth and infra-red, but no Wi-Fi. There's not a lot of storage compared to some of the other units here — just 32MB — but that should be enough for a large address book and PIM data. In addition, the P910i has a Memory Stick Duo slot and ships with an adaptor for Memory Stick Mini cards. There's out-of-the-box support for Outlook and Lotus Notes.

The design is thoughtful and innovative. The P910i is in phone mode with the keypad closed, with a compact screen and standard numeric

keypad. In this mode, the screen features larger icons that can be navigated using the jog dial on the left of the device.

Flipping the keypad open reveals a complete QWERTY keypad, while the display opens up to its full 3.1in, 320 x 208 size and becomes a touchscreen. Thanks to the integrated keypad, there's no dependency on the touchscreen, though key placement is very tight and makes text entry somewhat challenging.

Startup and SIM read times were competitive at 35 and 70 seconds respectively. But battery life is where the P910i really stands out, with an exceptional 400 hours of standby time and 13 hours' talk.

Vodafone BlackBerry 7100v

Distributed exclusively in Australia by Vodafone, the BlackBerry 7100v treats email like the telephone — always on and received instantly. As such it's very handy, though calendar and address book functions aren't the 7100v's strong suit.

Desktop connectivity is through standard USB cable — no infra-red or Wi-Fi. There is Bluetooth, but it's limited to wireless headsets; it's not possible for other users to access the stored information since Bluetooth data transfer isn't supported. The 32MB of memory plus 4MB SDRAM isn't a lot, though it's enough for a large address book, diary and a substantial volume of email.

The 7100v runs a Java-based BlackBerry operating system. The jog dial on the right is used for navigation as well as an action button,

making it easy to move around the system using just your thumb (as long as you use it right-handed).

Text entry is simple through a keyboard arrangement that's sort of a cross between a full QWERTY keyboard and the popular T9 input used on many mobile phones. There are 20 keys (each allocated two letters), and predictive text input.

The 7100v has the widest range of PIM compatibility, including Outlook, Lotus Organizer, Lotus Notes and ACT!, but the lack of a touchscreen lets it down.

Battery life was rated at a solid 192 hours on standby and four hours of talk time — around the middle of this pack. Startup time was just 15 seconds — easily the fastest in the roundup.

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- Supports bandwidth control to enhance voice quality
- Web management Interface
- Easy to Deploy

Model No	Phone Interface	IP-Sharing function
VOI-1110	1 x FXS	Y
VOI-2100	1 x FXS + 1x FXO	Y
VOI-2110	2 x FXS	Y
VOI-4100	4 x FXS	X

LevelOne H.323 End User Solution



- Complies with H.323 v3 protocols
- Easy installation
- Cost-effective

Model No	Phone Interface	Ethernet Port
VOI-1000	1 x FXS	1 x 10 Mbps
VOI-1020	1 x FXS	2 x 10/100 Mbps

LevelOne H.323 Enterprise Solution



- Complies with H.323 v3 protocols
- Supports bandwidth control to enhance voice quality
- T.38 real-time fax relay for interoperability among other VoIP facility
- Web management Interface
- Easy to Deploy

Model No	Phone Interface
VOI-2000	2x FXS
VOI-4000	4x FXS
VOI-4001	2 x FXS + 2 x FXO
VOI-8000	2 slots for optional 4 x FXS modules or 4 x FXO modules

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E-mail: sales@tecksel.com.au
VIC Premier I.T. Distribution
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Website: www.premierit.com.au
E-mail: sales@premierit.com.au

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Website: www.networkbroadband.com.au
E-mail: sales@networkbroadband.com.au

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Website: www.mimp.com.au
E-mail: sales@mimp.com.au

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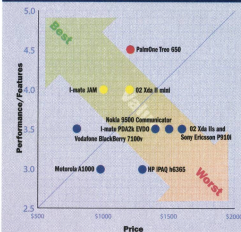
Asia Branch
Digital Data Communications Asia Co., Ltd.
E-mail: sales@ddcasia.com.tw
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PDA phones

					★ Editor's Choice					
Model	BlackBerry 7100v	Motorola A1000	i-mate JAM	O2 Xda II mini	palmOne Treo 650	HP IPAQ H6365	i-mate PDA221 EVO	Nokia 9500	O2 Xda IIs	Sony-Ericsson P910N
Price	\$799	\$979	\$999	\$1,199	\$1,199	\$1,299	\$1,399	\$1,499	\$1,599	\$1,599
Operating system	BlackBerry OS	Symbian 7.0	Windows Mobile 2003 2nd Edition	Windows Mobile 2003 2nd Edition	Palm OS 5.4	Windows Mobile 2003	Windows Mobile 2003 2nd Edition	Symbian 7.0	Windows Mobile 2003 2nd Edition	Symbian 7.0
Mobile network connectivity	GSM 850/900/1800/1900, GPRS	W-CDMA 2100, GSM 850/1800/1900, GPRS	GSM 850/1800/1900, GPRS	GSM 850/1800/1900, GPRS	GSM 850/900/1800/1900, GPRS, EDGE	GSM 850/900/1800/1900, GPRS	1x EVDO, dual band 800/1900, GPRS	GSM 900/1800/1900, GPRS, EDGE	GSM 850/900/1800/1900, GPRS	GSM 900/1800/1900, GPRS
Other connectivity	Cable, Bluetooth (headset only)	Cradle, Bluetooth	Cable, infra-red, Bluetooth	Cable, infra-red, Bluetooth	Cable, infra-red, Bluetooth	Cradle, infra-red, Bluetooth, Wi-Fi	Cradle, infra-red, Bluetooth	Cable, cradle, infra-red, Bluetooth, Wi-Fi	Cradle, infra-red, Bluetooth, Wi-Fi	Cradle, infra-red, Bluetooth
Battery life (standby/talk, hr)	192/4	170/4	190/3.5	180/5	300/6	140/4	300/6	640 x 200 (secondary display 120 x 120)	168/4	400/13
Screen size (in)	2.4	2.9	2.8	2.8	2.6	3.5	3.5	4.5	3.5	3.1
Screen resolution (pixels)	240 x 260	208 x 320	240 x 320	240 x 320	320 x 320	240 x 320	240 x 320	640 x 200 (secondary display 120 x 120)	240 x 320	208 x 320
Colours	65K	65K	64K	64K	65K	64K	64K	65K	64K	262K
Touchscreen	✗	✓	✓	✓	✓	✓	✓	✗	✓	✓
Integrated keyboard	✓	✗	✗	✗	✓	Clip-on	✓	✓	✓	✓
Size (HxWxcm)	11.4 x 5.6 x 2.0	11.5 x 5.7 x 1.9	10.8 x 5.8 x 1.8	10.8 x 5.8 x 1.8	11.3 x 5.9 x 2.3	13.8 x 7.5 x 2.1	12.5 x 7.0 x 1.9	14.8 x 5.7 x 2.4	12.5 x 7.2 x 1.9	11.5 x 5.8 x 2.6
Weight with battery (g)	120	162	160	150	178	190	210	230	210	155
Processor	Not stated	ARM 168MHz	Intel PXA272 416MHz	Intel PXA272 416MHz	Intel PXA270 312MHz	Texas Instruments OMAP 150 266MHz	Intel PXA263 400MHz	Not stated	Intel PXA263 400MHz	ARM 9 156MHz
Built-in memory (total/user accessible, MB)	32/32 plus 4MB SDRAM	24	64/57 plus 7.6MB file store	64/57 plus 7.6MB file store	32/22	64/55 plus 20MB file store	128/125 plus 43MB file store	80	128/125 plus 43MB file store	32 + 64MB user memory
Memory expansion	No	TransFlash	SD/SDI/O/MMC	MMC/SD/SDI/O	MMC/SD/SDI/O	MMC/SD/SDI/O	MMC/SD/SDI/O	MMC	MMC/SD/SDI/O	Memory Stick Duo
Camera	N/A	1.2 megapixels	1.3 megapixels	1.3 megapixels	VGA	VGA	VGA	VGA	VGA	VGA
MS Word support	Read only	Read only	Read only	Read only	✓	✓	✓	✓	✓	✓
MS Excel support	Read only	Read only	Read only	Read only	✓	✓	✓	✓	✓	✓
Messaging	SMS, email Outlook, Lotus Notes *	SMS, MMS, email Outlook, Lotus Notes	SMS, MMS, email Outlook	SMS, MMS, email Outlook	SMS, MMS, email Outlook, Palm Desktop	SMS, MMS, email Outlook	SMS, MMS, email Outlook	SMS, MMS, email Outlook, Lotus Notes	SMS, MMS, email Outlook	SMS, MMS, email Outlook, Lotus Notes
Out-of-the-box PIM support	Outlook, Lotus Notes *	Outlook, Lotus Notes	Outlook	Outlook	Outlook, Palm Desktop	Outlook	Outlook	Outlook, Lotus Notes	Outlook	Outlook, Lotus Notes
MP3 player	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year
Accessories included	Travel charger, holster, headset	Wired headset, Bluetooth headset, case	Headset, universal power adaptor, pouch	Headset, universal power adaptor, 256MB memory card	Headset, universal power adaptor	Headset, universal power adaptor, leather case	Headset, universal power adaptor, pouch	Headset, charger, cradle	Headset, universal power adaptor	Headset, universal power adaptor, cradle, case, 32MB Memory Stick Duo
Benchmark	N/A	N/A	Spb Benchmark: 1,244	Spb Benchmark: 1,244	Speedy 4.1: 1,389	Spb Benchmark: 754	Spb Benchmark: 1,325	N/A	Spb Benchmark: 1,325	N/A
Startup test 1 - dial number (sec)	15	62	38	38	55	40	35	30	35	35
Startup test 2 - also read (sec)	N/A	N/A	64	64	105	111	N/A	50	62	70

* also includes: Outlook Express, Lotus Organizer, Schedule+, Netscape, ACT!, GroupWise

apc price-to-performance ratio



There's not a lot separating the field, but palmOne's Treo 650 has earned the Editor's Choice award. The difference comes down to data input: with the Treo 650 there's rarely any need to reach for the stylus. Icons are large enough to tap with a finger and the full QWERTY keyboard is easily the best in the field. Throw in quad-band telephony and Bluetooth and it's an excellent package, though for the next version, we'd suggest palmOne adds more memory and Wi-Fi.



The O2 Xda mini/i-mate JAM aren't far behind, but the disadvantage of their compact size is that the stylus is often required. The phone functionality seems like an add-on and isn't as well integrated as the Treo 650, though multimedia capability is excellent.

If portability isn't a concern, consider the Nokia Communicator 9500 and the O2 Xda IIs. These are top-class units which lose points because they're big, heavy and, in the case of the O2, have poor battery life.

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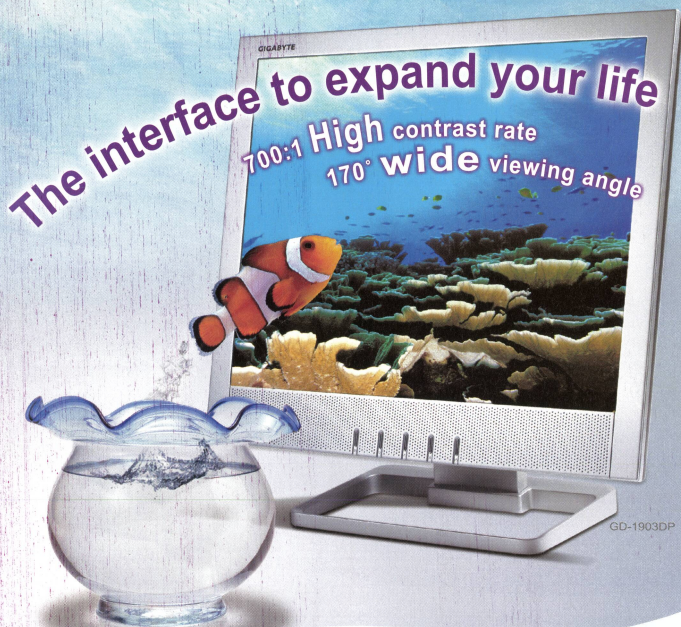
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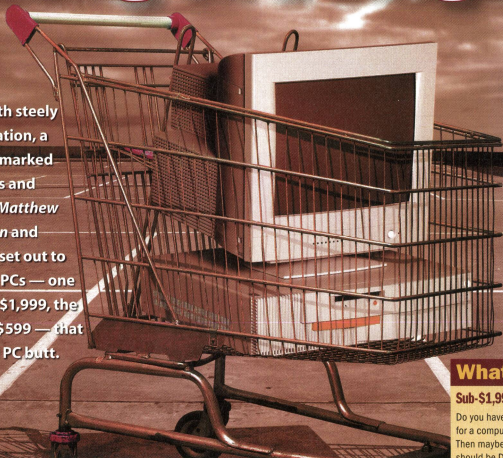
Model	GD-1903DP	GD-1703BP/DP
Display Type	19" TFT LCD	17" TFT LCD
Display Area	376(H)x301(V)mm	338(H)x270(V)mm
Max. Resolution	1280(H)x1024(V) @75Hz	1280(H)x1024(V) @75Hz
Pixel Pitch	0.294x0.294mm	0.264x0.264mm
Contrast Ratio	700:1 (Typical)	450:1 (Typical)
Brightness	250 cd/m ² (Typical)	260 cd/m ² (Typical)
Response Time	25ms	16ms
Viewing Angle	170° (H), 170° (V)	140° (H), 140° (V)
Audio Output	2.5 Watt x 2	2 Watt x 2
PC Connector	D-sub 15pin, DVI	BP: D-sub 15pin DP: D-sub 15pin, DVI



* Specifications are subject to change without notice.
* Subject to the ability to source components in a timely manner and subject to component availability.
* All trademarks are registered trademarks of their respective companies.
* Performance is for illustrative only and may not represent actual results.
* All prices are subject to change without notice. Please refer to our website for the latest information.

Smart cart: building on a budget

Armed with steely determination, a wad of unmarked banknotes and a toolkit, *Matthew Overington* and *Nick Race* set out to build two PCs — one for under \$1,999, the other for \$599 — that kick retail PC butt.



APC's mission was to build two systems. The first challenge was to assemble the most powerful computer possible for under \$1,999, designed for general use. The second was to put together a machine that would run productivity apps and surf the Net for just \$599 although, at this price, a Windows OS would need to be substituted by Linux (see cover DVD).

These aggressive price limits were set to showcase the deals that can be found by hunting around online. The prices were totally realistic at the time of writing and no special deals were obtained. By the time you read this, prices could be even lower.

The first step was to make a list of the required hardware for each machine, followed by a visit to Shopbot (www.shopbot.com.au) to search for low prices on computer hardware. While Shopbot doesn't include all vendors, it's a good starting point and can be used to confirm whether the prices you've been quoted are competitive.

The criteria for the selection of parts will vary depending on each user's final goal for each machine. Our sub-\$1,999 PC, for instance, had to be a strong all-rounder that would be equally at home running productivity applications, games, surfing the Web, digital video authoring and managing household expenses. The focus was on assembling a no-compromise system that would stand up to the varied demands of a tech-savvy family.

On the other hand, the \$599 PC showcases the power that can be harnessed for a fraction of the cost of a retail system. A quality machine at this price point is ideal for a student or other user with modest requirements and can be used to surf the Internet, drive office software or even act as a home router. And to stay within our budget, we chose the hot Linux distro SimplyMEPIS, which comes with great install options and even manages your iPod files.

What's inside

Sub-\$1,999 PC, page 82

Do you have exacting requirements for a computer for home or work? Then maybe your next upgrade should be DIY. Doing it your own way provides complete freedom of choice to spec up a system that's perfect for you.

\$599 PC, page 86

With careful component selection, bargain hunting and a willingness to get down and dirty with Linux, this \$599 system breaks all value for money barriers. This is one example where the whole is greater than the sum of its parts.

All clear, page 92

So, you've built a super system capable of holding its own against machines worth much more. Want proof? Then take a look at the prices of retail offerings with similar specs and decide whether or not it's worthwhile building your own system.

Sub-\$1,999 all-round PC

Two grand buys a lot of grunt if you're prepared to build a system yourself. Just don't expect the comfort of tech support and a warranty.

A do-it-all machine for under \$2,000 will inevitably involve a compromise between features and performance, but with a little thought and a bit more effort the budget offers plenty of room to move. It's safe to skip a little on non-vital system components such as the optical drive or mouse, but the power supply, motherboard and RAM have to be first-rate to ensure the system remains reliable and stable. Wherever possible, this means buying brand-name components with good warranty terms.

This system combines quality components to create a fast, reliable system complete with a Microsoft optical keyboard and mouse and a 17in TFT screen. It's suitable for some gaming, digital

photography or video editing, surfing the Internet and running work apps. The budget was spread fairly evenly between the processor, RAM, screen, DVD writer and hard disk. A further \$145 was allocated for an OEM version of Windows XP and \$20 for a floppy.

For the purposes of this exercise we sourced the necessary components anonymously from the cheapest suppliers we could find — in most cases, online shops. No special deals were done. Umart (www.umart.com.au) often features as the source of the components because at the time of writing it offered the best prices. There's no guarantee that others won't be matching those deals by the time you read this.

AOpen H500W tower case



A great PC needs a quality case. The AOpen H500W tower case is a bargain at \$99 with a 350W power supply. It has a sleek aluminium front and steel back and sides — its good looks match its solid functionality. There's no slide-out motherboard tray, but the internal rolled edges ensure safe construction.

Since the case is one of the few components which will survive several upgrades, spending a little extra to get a brand you're happy with is a worthwhile investment.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$108

Gigabyte GA-81915P-G motherboard

This stock standard i915P-based board from Gigabyte doesn't break any moulds when it comes to motherboard design or functionality, but it hits the spot as a reliable, fast all-rounder.

This board was chosen as it has all the required features, and nothing that won't be used in this setup.

Although choosing a Socket 478 board and CPU would be cheaper, this Socket 775 model will survive a future CPU upgrade. Notably, the board supports dual-channel DDR RAM rather than the unproven and more expensive DDR2 variety.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$155

Intel Pentium 4 530 CPU

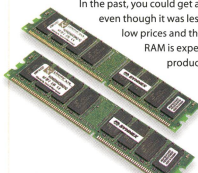


Nobody can argue with the performance quality of a Pentium 4 processor, and at \$299 the cost-to-performance equation is working in Intel's favour. Proponents of rival chipmaker Athlon will wait about 64-bit support, but this is largely academic until there's a final release of a compatible 64-bit version of Windows. The 530 model runs at 3GHz, which is ample for just about every processing task you can throw at it. And for less than \$300, it's brilliant value.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$265

Kingmax PC3200 1GB RAM



In the past, you could get away with using cheaper RAM, even though it was less reliable. Considering today's low prices and the much faster speeds and loads RAM is expected to handle, a premium product is the way to go.

This Kingmax-branded PC3200 module is stable and capable of running the machine snappily — without breaking the bank. Overclockers and performance freaks can easily fork out a few hundred more for memory rated faster than their frontside bus, though in this case, we're quite happy with the performance out of the box.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$219

Western Digital WD2000JD 200GB SATA hard drive

There are two things you can never have too much of: memory and hard disk space. Working within budget means settling for a mere 200GB HDD, but even six months ago this kind of capacity was unthinkable for the price. This Western Digital drive has an 8MB cache for faster transfers via Serial ATA. It's not SATA II, but the board won't support it anyway. The 7,200rpm spindle is iffy for video editing, but the compromise for extra capacity is acceptable.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$146

Pioneer DVR-A09XLA Double Layer DVD±RW drive

A modern PC is nothing without a DVD writer. The speed with which the standard has been adopted compared with CD-R has been phenomenal and, with media prices still dropping, burning to DVD is convenient and cost-effective.

This drive is an excellent performer, though the more expensive Sony DRU-710A (\$179) would be first choice if the cash could be spared. The Nero 6 OEM suite is a great value addition to this drive, one of the reasons it was selected over cheaper offerings on the market.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$155

BenQ FP71E 17in LCD monitor

The FP71E 17in LCD monitor from BenQ complements this PC perfectly. With a 12ms refresh rate, it's more than adequate for video and the occasional game, and the built-in speakers are good enough for general work purposes or playing music quietly.

The FP71E connects to the X700 via DVI, which means that the signal remains digital from end to end. The monitor even matches the case and keyboard (for those who care about such things). Of course, a bigger screen can always be used, but the size, specs and price for this 17in model make it just right.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$375

Microsoft Standard Wireless Optical Desktop

This optical keyboard and mouse combo from Microsoft offers plenty of comfort and freedom. We chose wireless peripherals for their extra flexibility and the clean look of fewer cables.

We splashed out a little when choosing this kit over a generic keyboard/mouse, believing that a good keyboard is an absolute necessity for those who spend a lot of time typing.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$98

Gigabyte RX70P-256 X700 Pro 256MB

This video card was chosen for its suitability for a multitude of uses. Video playback is smooth and even more recent, power-hungry games will shine. Editing shouldn't pose any major problems either, and support for dual monitor setups is built-in.

Given our budget, every item is a compromise. Corners could have been cut elsewhere to include a games-oriented X800, but as an all-round card the X700 Pro is more than sufficient.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$299

Show me the money

Assembled, these components notch up benchmark scores of 19.2 under Multimedia Content Creation Winstone 2004 and 27.6 under Business Winstone 2004, indicating that the machine is suited to running just about any modern software.

But, if the budget was increased by \$500, what would we change? The short answer is the CPU and graphics card.

The 3GHz Pentium 4 530 is a good deal at \$265, but the 3.4GHz 550 model (\$403 from Umart) is a better option. That said, return for investment diminishes drastically as CPU speeds get higher.

The X700 Pro is an excellent all-round video card, but the extra cash will get us into some serious gaming. ABIT's Radeon X800 Pro with VIVO (video in/

video out) from AusPC Market (www.auspcmarket.com.au) will create a machine that will cope with demanding 3D games. The X800 retails for \$660 — \$314 more than the X700 — but is worth it if you have the money.

The performance hike from the X700 Pro to the X800 Pro is around 10% in Doom 3, and similar results can be seen across other graphically demanding games. The VIVO functionality is also a boon for video editing.

Since one of the only failings of the Gigabyte motherboard is its lack of FireWire support, and FireWire is preferred for transferring video from a digital camcorder, the final selection is a FireWire card. A SkyMaster three-port FireWire card with an additional four USB ports costs \$77 from AusPC Market.

The result . . .

BenQ FP71E 17in LCD monitor

- 1,280 x 1,024 native resolution
- 500:1 contrast ratio
- 12ms refresh rate
- 300cd/m² brightness
- Built-in speakers
- DVI and D-sub connectors

Microsoft Standard Wireless Optical Desktop

- RF wireless keyboard and mouse
- Three button optical mouse with wheel
- Keyboard with hotkeys
- USB and PS2 connectivity

Gigabyte RX70P-256 X700 Pro 256MB video card

- ATI Radeon X700 Pro-based card
- 256MB of DDR3 graphics memory
- DVI and D-sub (VGA) outputs
- PCI Express x16 interface
- Dual monitor support

Intel Pentium 4 530 CPU

- 3GHz Prescott core
- 800MHz frontside bus
- 1MB Level 2 cache
- LGA775

Kingmax PC3200 1GB RAM

- 2 x 512MB DIMMS
- DDR 400 — PC3200 speed
- Capable of 2-2-2-5-1 memory timing

AOpen H500W tower case

- 4x 5.25in external drive bays
- 2x internal and 1x external 3.5in drive bays
- Aluminium fascia, steel sides and construction
- 2x front USB 2.0 and 1x FireWire port
- 350W power supply

Pioneer DVR-A09XLA DVD±RW drive

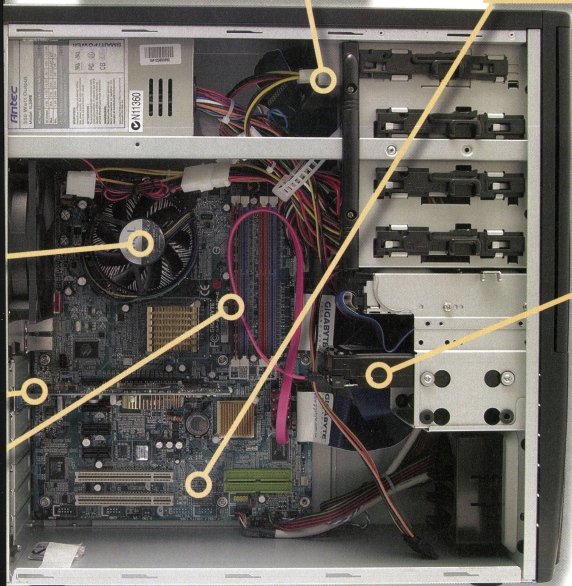
- 16x DVD±R writing
- 8x DVD+RW and 6x DVD-RW rewriting
- 40x CD-R and 24x CD-RW
- 2MB cache with buffer underrun protection
- Nero 6.6 OEM suite

Gigabyte GA81915P-G motherboard

- Socket 775 Pentium 4 support
- Intel 915P chipset with ICH6 Southbridge
- PCI Express x16 and 3 x1 slots
- 2x PCI slots and 8x USB 2.0 ports
- 4x Serial ATA ports and 2x IDE connectors
- Gigabit Ethernet
- 7.1-channel CMedia 9880 chip with Intel High Definition audio
- Dual-channel DDR memory support

Western Digital WD2000JD

- 200GB capacity
- SATA connected
- 8MB cache
- 7,200rpm spindle speed



\$599 budget buster

Even we weren't sure whether a complete PC could be built for \$599. But we did it. And hey, it's not half bad.

Whether you're a seasoned system builder or barely know how to use a mouse, everyone can find a use for a cheap and cheerful PC. But low cost doesn't necessarily mean low power. By sacrificing some non-essential features, this system came in under \$599 including a keyboard, mouse and screen.

One important consideration when building an inexpensive box is the ability to upgrade. After all, the budget might be tight right now, but that tax refund/lottery win/bank heist could be the perfect

opportunity to bolster specs. Need more grunt? No problem. Pull out the Celeron processor, replace it with a Pentium 4, boost the RAM and you've got a zippy production machine. Want to lose a substantial portion of your life to Doom 3? Simply drop in a top-of-the-line AGP video card and you'll be able to play all the latest games without a hitch.

As it is, this surprisingly powerful little PC is great for students, could even be used as a (rather noisy) media centre, or a dedicated "build box" for coders.

Generic midi tower with 400W PSU



One of the biggest compromises when working with a really tight budget is the housing for the PC. Though buying a good case and high-quality power supply is always recommended, sometimes it's just not possible.

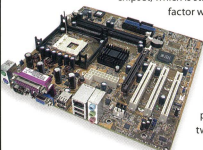
At \$49, this generic case is purely there for the power supply and keeping the components off the desk. And don't expect neatly rolled edges, slide-out motherboard tracks or quiet fans for this price either.

To its credit, the thin wall construction means the case is light, and if you move machines around regularly, a few dents will only add to its charm.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$49

ASUS P4S800-MX motherboard



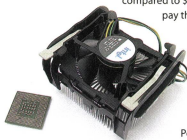
This Socket 478 motherboard runs on the SiS661FX chipset, which is stable and cheap. The deciding factor was the integrated graphics, saving money on a separate card. An AGP slot means a better graphics adaptor can be included in the future.

This motherboard covers all the basic specs required for a productivity-focused machine: two IDE ports for drives, onboard graphics and sound, plus onboard LAN and DDR support. With a little extra cash, we'd opt for a Socket 775-based motherboard as it will remain upgradable for longer.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$89

Intel Celeron D 320 processor



Sempron processors can be bought for as little as \$87, compared to \$105 for this Celeron. So why pay the extra? The clincher is the cost of the motherboard — as a total package the Celeron is cheaper.

The D 320 is no slouch, even with its rock-bottom price tag. The CPU is essentially a Northwood core Pentium 4 with half the cache, so performance is pretty hot for a PC at this price point. An extra \$150 will give you a true Pentium 4 at 2.8GHz, but that's a lot of extra cash for a small increase in performance.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$105

LiteOn LTN-526 52x CD-ROM drive



There's little that can be said about a CD-ROM drive these days — they read CDs and that's it. But inclusion of an optical drive is an absolute necessity, and this is the cheapest one around at the moment.

We were bowled over by the price — a complex, laser-driven component for less than \$20. It's quite fast for a CD-ROM and shouldn't have problems with burned CDs. A more useful CD-RW drive could be had for an extra \$25, while an extra \$50 would get a CD-RW/DVD-ROM combo drive for a multimedia kick.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$19



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- Intel® Centrino® Mobile Technology
- Intel® Pentium® M processor 700 sequence • Mobile Intel® 915M Express Chipset
- Intel® Wireless/PRO Network Connection 2915 a/b/g
- Microsoft® Windows® XP Home/Professional

- 12.1" WXGA
- ASUS LiveFrame video capturing software
- Bluetooth™ (optional)

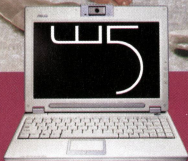
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■ Classic black & white designs



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LG 710S 17in CRT monitor

This LG monitor isn't as low-spec as its price tag might suggest. Though not a flat screen and considerably bulkier than an LCD, the LG 710S is more than adequate for everyday use. It supports a top resolution of 1,280 x 1,024, though the recommended resolution at 85Hz will be much easier on the eyes, especially for long stints.



The cheapest LCD screens cost some \$200 more, so CRT is still the budget-conscious choice. Thanks to better colour accuracy and refresh rates, they're preferred by designers and serious gamers too. Integrated speakers are rare, or all bases would be

covered for this PC. The 12-month warranty is a little short for this technology, but there have been few reported issues with this particular model.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$148

AOpen keyboard/Newman 3D Deluxe optical mouse

These are basic, entry-level components included to complete the system. Folks who spend a good portion of the day bashing away at a keyboard might like to spend a little more to save their wrists, but this keyboard is purely functional.

The mouse is of the optical variety and while it's preferred over the older ball type, it's also the cheapest around.



Details

Supplier	Umart
Online	www.umart.com.au
Price	\$38

Generic RAM 256MB PC2700



More megabytes are always preferable, especially when running Microsoft Windows XP. A mere \$30 extra would buy 256MB of GeIL memory, which would really help move this machine along.

With cheaper, generic memory modules, always make sure a warranty is offered by the manufacturer or distributor — using cheap RAM is a false economy if the chips turn out to be duds. The good news in

this case is that the vendor covers all components with a 12 month warranty, so if the memory suffers dementia before then, it can be swapped for a fresh set of working modules.

Details

Supplier	Umart
Online	www.umart.com.au
Price	\$55

Maxtor DiamondMax Plus 8 40GB



Detail

Supplier	Umart
Online	www.umart.com.au
Price	\$73

This DiamondMax hard disk was the logical choice in this price bracket, considering it runs at UDMA133 (matching the motherboard), has a 2MB cache for quick disk access, and a decidedly non-budget 7,200rpm spindle.

Apart from the 40GB capacity, there's nothing bad to say about this drive. More money would only go into buying more megabytes.

Choosing software

Though the \$599 model will run Windows XP, it won't run well. In fact, after installing all those applications to make the system useful, it'll crawl.

The solution to this problem is to find an extra \$77 for the budget and add another 256MB of DDR RAM before installing Microsoft's flagship operating system.

If you take this route, however, consider that the \$325 retail price of Windows XP Home is more than half the total cost of the whole machine. There is an alternative: you can turn the system into a perfectly functional workhorse by choosing an appropriate Linux distro and an accompanying software suite.

SimplyMEPIS (www.mepis.com) offers a free Linux distribution for download on its Web site. SimplyMEPIS includes all the packages required to get a full OS up and running, along with a wide range of common Linux utilities and applications.

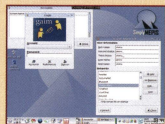
OpenOffice 1.1.4 is included on this month's cover DVD, which would otherwise be a significant download. This free productivity suite is designed to offer file compatibility with popular Microsoft Office file formats. Follow the installation instructions and your newly

built machine will be furnished with a whole range of useful, efficient productivity software.

A Linux distribution is the obvious OS of choice on a limited budget. However, you can also use an older version of Windows if you've got an unused licence left over. Older versions of Windows are far less demanding of system resources than newer editions (such as XP), but remember that you'll still have to outfit the machine with software, and not all current applications support older versions of Microsoft's operating system.

Winamp, OpenOffice and Mozilla Firefox provide solid free alternatives to commercial applications and are great for first time Linux users.

Spend some time looking at this month's cover DVD for other free software you can use to turn your custom-built budget system into an even more useful tool.



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LG 710S 17in CRT monitor

- Max resolution 1,280 x 1,024 @ 66Hz
- Recommended resolution 1,024 x 768 @ 85Hz
- D-sub (VGA) connector
- Invar Shadow Mask with 0.23mm dot pitch

AOpen keyboard & Newman 3D Deluxe optical mouse

- 104 key "Windows" keyboard
- PS2 connectors
- Optical mouse

Intel Celeron D 320 processor

- 2.4GHz with Northwood core
- 256k Level 2 cache
- Socket 478 with 533MHz frontside bus

Generic RAM 256MB PC2700

- DDR333/PC2700 speed

Generic midi tower with 400W PSU

- 1x 3.5in drive bay and 4x 5.25in drive bays
- 400W A-Link brand power supply

ASUS P4S800-MX motherboard

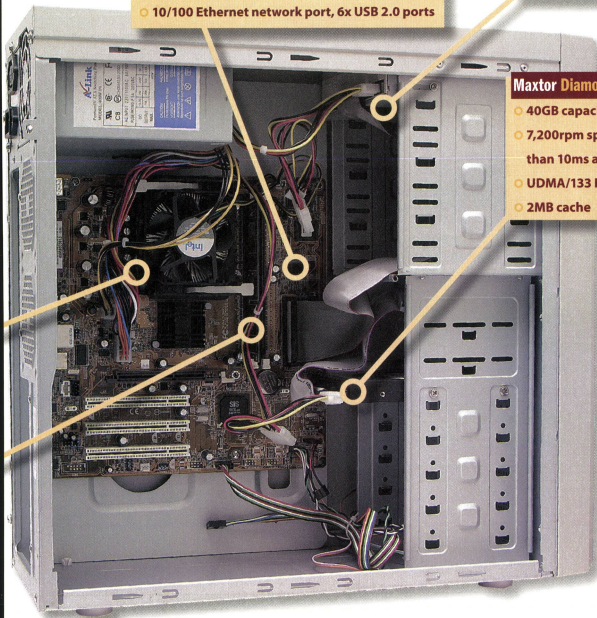
- SiS661FX Northbridge and SiS963I Southbridge
- SiS Real 256E integrated graphics
- 1x AGP8x and 3x PCI slots
- Supports Socket 478 Pentium 4/Celeron
- 800MHz frontside bus support
- 5.1-channel audio using ADI1888 chip
- 10/100 Ethernet network port, 6x USB 2.0 ports

LiteOn LTN-526 52x CD-ROM

- 52x CD-ROM read speed
- Maximum transfer rate of 7,800KB/s
- Supports CD, CD-R and CD-RW
- 2MB cache

Maxtor DiamondMax Plus 8 hard drive

- 40GB capacity
- 7,200rpm spindle speed with less than 10ms average access time
- UDMA/133 PATA interface
- 2MB cache



Price breakdown

After all is said and done, we've got two fantastic little systems built and ready to go. But how much money has really been saved?

APC sub-\$1,999 system versus Dell Dimension 4700

In order to illustrate the benefits of DIY PCs, our home-built sub-\$1,999 machine was compared with a store-bought model that came closest to matching its specs, the Dell Dimension 4700. See the table below for full details of the specifications of the Dell system.

The only real difference is the one-year warranty and support from Dell, and the fact that it's pre-assembled. With hardware, an operating system and delivery included, the custom-built machine is \$600 cheaper than the store-bought system. The warranty offered on each component is the same length as the one year offered by Dell, but each part must be dealt with individually.

No two people have exactly the same requirements from a computer. The most compelling reason to build a machine from scratch is the freedom to select the parts you want and the ability to tailor a system to your individual needs.

The specs

APC sub-\$1,999 PC

Dell Dimension 4700



ADPn H500W tower case

Dell case

Intel Pentium 4 530

Intel Pentium 4 530

Gigabyte GA-81915P-G

Dell B15 motherboard

1GB Kingmax PC3200

1GB RAM PC3200

Western Digital WD2000JD 200GB

1 x 160GB hard drive

Pioneer DVR-A09XLA 16x Double Layer DVD±RW drive

16x Double Layer DVD writer

BenQ FP71E 17in LCD (digital/analog)

Dell 17in LCD (analog)

Microsoft Standard Wireless Keyboard/Optical Mouse

Dell Wireless Keyboard/Optical Mouse

Gigabyte RX70P-256 X700 Pro 256MB PCIe

ATI Radeon X300 128MB PCIe

Floppy disk drive

Floppy disk drive

Microsoft Windows XP Home (OEM)

Microsoft Windows XP Home (OEM)

\$1,985

\$2,697.20

APC \$599 system versus, well, nothing really. . .

Though PC retailers sometimes feature specials offering machines for around \$599, it's relatively hard to find a regular retail system in this range. In fact, the nearest machine found was the Dell Dimension 3000. This \$1,098 system features a Celeron 325 2.8GHz processor in its most basic configuration, a 40GB hard drive and 256MB of RAM, though the Dell system includes a copy of Windows XP Home.

This is where buying from a larger retailer has its benefits: OEMs have access to inexpensive copies of Windows XP, so a copy of the operating system doesn't add a significant amount to the price of a system. On the other hand, an aftermarket copy of Windows XP Home will set you back \$325. This significant price discrepancy means that if you want to run a copy of the operating system, you're really better off going for a bundle from an OEM.

Spending \$325 on an OS for a \$599 PC seems like overkill, and running Linux on a system of this calibre makes much more sense. After all, any extra cash would be better spent on extra RAM, a larger hard disk or an optical drive with writing capabilities. The real beauty of our \$599 machine is the fact that it can serve a number of purposes.

Buyer beware

While there are lots of online hardware vendors that take pride in fast, efficient service, there are also legions of dodgy operators. The best way to avoid them is to rely on reputable companies and suppliers. While that shady character in a dark corner of your local swap meet may be able to offer fantastic prices on RAM, he might not be paying duty on the hardware, and there's a good chance he won't be there next week to offer a warranty. And if the hardware is grey-imported, the manufacturers may not support a warranty claim.

The PC industry thrives on aggressive competition and tight margins, so prices generally don't vary widely between shops. Rule of thumb: if a price sounds too good to be true, it almost certainly is. But that's not to say that you can't get good service from computer markets and swap meets. Just be clever. Go to the markets with a good idea of

current pricing and insist on buying from vendors with established shopfronts so you've got recourse if you take some hardware home and find it doesn't work.

Your local computer store might not be able to match the prices offered by online vendors, but factor in the cost of shipping when making your decision. Bear in mind that it could also be worth paying a little extra to minimise hassles further down the track if a product turns out to be faulty: the cost of shipping it back to the store you bought it from could quickly negate the savings of buying over the Net.

Another reason to support your local PC shop is purely to keep the business alive and handy. Who else will be there to help when you need a Serial ATA cable or power connector at short notice? That kind of convenience is worth a few extra dollars in the long run.



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Who gives a Fleck? CSIRO's Peter Corke with the Fleck sensors his team created. (Courtesy of CSIRO)

altered by land clearing leaching nitrates from coastal farms. Collected data will be relayed between motes to a solar-powered microwave transmitter that will shuttle the data back to researchers on the mainland.

Monitoring changing environmental conditions in remote areas has always been a labour-intensive process. This has created an opportunity for motes, which continuously collect data for several years and talk to each other using a wireless grid network with built-in redundancy. Nodes can be up to 125m apart using conventional 2.4GHz technologies, though CSIRO researchers have extended this to 700m by lowering the frequency to 433MHz.

FLECKS AND FIGURES

CSIRO, which began researching wireless sensor networks using commercially available motes, recently changed course and started building programmable motes of its own, called Flecks, that incorporate a wireless radio, GPS chip, compass and accelerometer. These last three components allow the devices to be attached to livestock and transmit information about their movement through remote paddocks via stationary, solar-powered transceivers mounted throughout the area. CSIRO has also built daughterboards to track light levels, humidity, temperature and soil moisture, giving the Flecks potential agricultural uses.

"Environmental monitoring is an important area within this country," says Dr Peter Corke, senior principal research scientist in Autonomous Systems at CSIRO's ICT Centre. "Around 20 research divisions within CSIRO alone are trying to understand various aspects of the environment, and all are critically in need of data. This data can be collected by very painstaking human observation, or by remote sensing from satellites. But wireless sensor networks can measure [activities] on the ground with a high sampling rate."

Corke, a robotics expert, began studying motes several years ago after it was suggested their environmental sensors could potentially provide a sort of digital ESP for purpose-built robots. For example, a firefighting robot could find hot spots by communicating with temperature-detecting motes mounted on the ceiling of every room.

These are the kinds of theoretical

Mote control



The paranoid among us believe spies are everywhere, but the latest gadgets from wireless researchers could prove them right. David Braue dives into the tiny world of motes.

While scientific evidence shows that the Great Barrier Reef is slowly degrading, it's hard to know exactly why. Townsville's James Cook University and the Australian Institute of Marine Science, together with researchers united through a government-backed initiative called Sensor Networks Group (www.sensornetworks.net.au), hope to change all that by seeding hundreds of tiny

sensors across different parts of the reef.

Equipped with chemical, noise, pressure and other sensors, each of the devices, or "motes", uses wireless communication to collect and relay data via its neighbours to a fixed microwave transmitter. Over the course of several years, they'll track variables such as boat movements and changes in water composition, which many suspect has been

What the hell is a mote and how do they work?

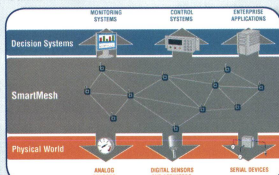
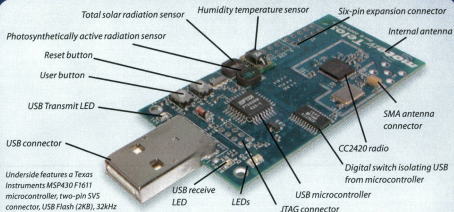
A mote is a device equipped with chemical, noise, pressure and other sensors that utilises wireless communication to collect and relay data via its neighbours to a fixed microwave transmitter. Runs on TinyOS.

ACTUAL SIZE



Crossbow Technology's MICA2DOT is roughly the size of a 20 cent piece.

Applications: temperature and other forms of environmental monitoring; data logging in hard-to-reach places; "smart badges" — wearable, active two-way "smart" tags. (Courtesy of Crossbow Technology)



Motev's Telos rev. B mote combines 802.15.4-compliant 2.4GHz wireless radio with humidity, temperature and light sensors, 8MHz CPU, 48KB for programs, and 1MB RAM for data storage. The USB port allows programming and debugging. (Courtesy of Motev)

Spread a few motes around and they'll not only collect info but build a meshed wireless LAN that passes data to a fixed (often laptop-powered) transmitter that relays readings via satellite or mobile network. (Courtesy of Dust Networks)

applications that drove the creation of motes, which were born several years ago at the Intel Research Berkeley laboratory jointly staffed by boffins from the University of California, Berkeley and Intel. Their goal was to produce self-sustaining, redundant sensor networks that could be used to monitor environmental variables as diverse as earthquake stress on building walls, migration patterns of birds, air pollution, soil contamination, danger zones within burning buildings, changing temperatures within a house and even the population density of cane toads.

Cane toads? At the University of New South Wales Faculty of Engineering, one group of students hopes to deploy arrays of microphone-equipped motes in fields. By capturing ambient sounds and using machine intelligence to lock onto the cane toad's distinctive call, a network of motes would be able to track the pests.

In another research project, backed by Western Australia's Bushfire Cooperative Research Centre (www.bushfirecrc.com), motes will collect humidity, temperature and

other relevant information that could help predict which areas are most prone to bushfires. In essence, the motes become the eyes and ears of systems that analyse information about the outside world.

MOTETECH

Visionaries years ago imagined "smart dust" — infinitesimally small sensors that derive power from their surroundings and communicate via wireless networks — but such devices are still years away. Motes just a few millimetres square have been produced, but miniaturisation reduces the amount of power and size of the wireless antenna that can be carried. Most mote research has therefore focused less on size than on combinations of sensors, power supplies and wireless networking techniques.

Power is a major issue in mote design. Since the devices are designed to be deployed in distant areas and then left alone, nobody

wants to hunt them down to replace batteries every few months. The most efficient motes can run for four or five years on a pair of AA batteries, while other, larger, devices combine solar cells and rechargeable batteries in a package that, theoretically at least, could last for 40 to 50 years.

At the other end of the scale, Professor Shad Roundy of the Australian National University in Canberra has been working on ways to build tiny motes that generate power from the very things they're monitoring. The vibration of a heating or cooling duct could bounce a cantilevered mass, for instance, producing enough kinetic energy to power the sensor indefinitely.

Different mote designs are available commercially and many more are in various stages of development, but they typically run TinyOS, an open source operating system developed specifically for wireless sensor

Motes typically run on TinyOS, an open source operating system

► networks and available for over a dozen different types of motes.

TinyOS (www.tinyos.net) was built for both extremely low power usage and flexible networking, with a granular power control system that keeps most components idle when necessary. TinyOS networking protocols are designed to maintain connectivity even if motes send just a few keep-alive pulses per minute. To keep power consumption to a minimum, motes typically operate in connectionless as well as conventional connection-based modes.

Early motes relied largely on proprietary technology for wireless communication. In mid-2003, however, passage of the IEEE 802.15.4 standard (also known as 802.15 TG4) provided a common standard for low-powered wireless networks. TG4 offers 16 communications channels in the 2.4GHz radio frequency band, 10 channels at 915MHz, and one channel in the 868MHz band, with data rates of 250Kbit/s, 40Kbit/s and 20Kbit/s respectively. The standard is currently being

revisited with the goal of producing an improved TG4b standard that's easier to use and offers better security.

SPIES AMONG US

Convergence around a common standard for wireless sensor networks has boosted the commercial potential of motes enormously. All sorts of sensor-based applications are now starting to trickle into the market, and further miniaturisation will shrink the devices — and their price tags.

"Motes are the version of smart dust that you can hold in your hand and use today," says Joe Polastre, a former Berkeley graduate student who co-founded Silicon Valley-based mote integrator Moteiv Corporation. "It may still be 10 years [before smart dust is a reality], but at least we're getting the software and integration down."

While useful in research environments, mote technology raises some questions. Current applications focus on monitoring in remote or uninhabited regions, but motes

could be put to all sorts of nefarious uses. A handful of microphone-equipped devices could, for instance, be hidden around a competitor's office to provide a 24-hour record of executive conversations. Heat- or motion-sensitive motes might alert burglars when an office is empty and ready for ransacking. And camera-bearing motes could make current privacy breaches by peeping Toms with cameras in their mobile phones pale into insignificance.

With their mix of communications and sensory capabilities, motes are the embodiment of the retina-scanning spiders that plagued Tom Cruise in the futuristic *Minority Report*. Mote advocates are working to address such issues, finding ways to make the networks detectable and to disable the nodes if necessary.

For now, such concerns are tertiary to the main goals of producing working motes and applications in which to use them. Motes remain a tool for researchers and engineers, and they hope to keep it that way. **ETC**

The mote has two faces

GOOD MOTES



Reef motes Detect changes in water composition, temperature and so on and relay data to solar-powered microwave transmitters on land for researchers to monitor reef degradation.



Cow motes Communicate with stationary, solar-powered transceivers mounted throughout paddocks to count and track livestock on the hoof.



Hot motes Temperature-detecting motes mounted on ceilings which advise firefighting robots on the location of hot spots within a building.



Hippy motes Self-sustaining sensor networks used to monitor environmental variables such as pollution levels, the effects of earthquake stress on buildings, and bird migration patterns.



Toad motes Microphone-equipped motes on Queensland farms that capture ambient sounds and lock onto the cane toad's distinctive call to track movement of the pest.

EVIL MOTES



Big Brother mote Hidden in desks and staff kitchens by bosses wanting to know how much everyone hates them.



Spy mote Same thing, but hidden in competitors' boardrooms to eavesdrop on executive secrets about the size of mahogany row washrooms.



Motion mote Heat- and motion-sensitive motes planted by burglars to detect when an office is empty and ripe for ransacking.



Pic mote Camera-bearing motes that replace time-honoured spy-holes and camera phones used by peeping Toms.



Retina-scanning spider motes Freaky titanium arachnids sent out by futuristic law enforcement officers which hunt you down, crawl all over you and scan your databased eyeballs to tell the cops where you're hiding.

Motes on the job

A bird in the hand: one of motes' first real jobs was to track the elusive Leach's storm petrel, a bird that nests inside a burrow on remote islands off the north-east coast of the US, then abandons the eggs for 18 hours a day. Scientists used to walk between burrows and stick their hands in to see when the birds left and returned. Now, more than 190 Motiv motes in the holes track the birds' movements and relay readings across the wireless sensor network, then via satellite to researchers. This test also proved that the motes' wireless technology could penetrate soil.



Could it one day be a case of where there's smoke, there are motes?

Where there's smoke, there's fire: temperature- and humidity-sensing motes could make life easier for firefighters, who currently spot fires by sitting for hours on top of tall towers in the forest. The University of Western Australia and Bushfire CRC are currently researching ways to deploy networks of motes that raise the alarm when conditions are conducive to bushfires.

Building bridges: one of the biggest problems with bridges, buildings and other structures is that they wear out, particularly when corrosive salt or natural events such as earthquakes hasten the process. Engineers may soon stick motes sensitive to pressure, vibration or salt onto or into structures to measure how much they're shaking and deteriorating. The result will be better detection of potentially dangerous faults.



The downside of motes in this instance is that motes will keep scientists in the lab when they could be out enjoying some fresh air.

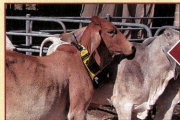


Life's good? Right up until the skin cancer diagnosis, anyway.

Warming homes and offices: installing motes throughout a building would allow a climate controller to track the temperature and adjust it accordingly. Motion-sensitive motes could instruct the system to shut off heating or cooling in unoccupied areas, while people could pin a mote onto their lapels to control the actual temperature from where they're sitting.

From dust to mud and back again: in Pinjar, WA, University of Western Australia researchers have deployed Mica2 motes linked to soil moisture sensors, another mote linked to a tipping bucket rain gauge, and other motes to transport data to a GSM transmitter. Such systems have useful agricultural applications, like telling farmers when faraway fields are dry and need watering.

Till the cows come home: driving across a property to count cattle takes time, petrol and lots of people. CSIRO researchers have mounted 20 Fleck-2 sensors on collars that are being used to track cattle as they move throughout experimental paddocks in Rockhampton, Queensland. Fleck-2 tracks location via GPS, orientation of the cow using a built-in compass, and movement using an accelerometer. Large-scale deployment could automate the traditional cattle call.



Cybercows never get lost.



Soil-sampling motes, each attached to two moisture sensors, could switch the sprinklers on as required.

Mines are so 1960s: like any new technology, the military has been quick to see the potential of motes. Rather than lay mines to track and impede enemy movement in hostile areas, forces could drop thousands of motes across the landscape. Each might detect pressure, movement, magnetic fields or even cameras to sense the presence of troops or trucks, then relay its information to commanders far away.

Roach bots — the next evolution in the gathering of military intelligence.





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Dialup's grim reaper?

Bring out your carcasses: wireless broadband provider Unwired wants your 56K modem dead.

Sydney wireless provider Unwired has launched a range of wireless Internet plans that are as cheap as dialup but provide always-on connectivity.

The \$15.95 plan provides 64Kbit/s speed — marginally faster than dialup — while for \$4 more per month, the speed doubles to 128Kbit/s.

"This is a huge potential market for us, with 73% of Sydney's Internet users still on dialup," said Unwired CEO David Spence, noting that this translates to 750,000 people.

Despite the low monthly cost, people who want to get onto Unwired's "wireless dialup replacement" service do need to buy one of the ISP's \$189 wireless modems. They can then upgrade to a full broadband service at any time, with speeds of up to 1Mbit/s.

The news will be frustrating for readers outside Sydney who don't yet have Unwired wireless coverage.

Competitor Personal Broadband Australia — which now has iBurst coverage in Sydney, Brisbane, the Gold Coast, Melbourne, Canberra, and soon in Wollongong, Newcastle and the NSW Central Coast — said it wouldn't be economical for it to compete with Unwired's pricing.



"We'd love to give everyone mobile Internet for \$20 a month, but the reality is that it's just not economically viable," said PBA CEO Jim Cooney.

iBurst services start at \$35 per month, and require a desktop modem costing between \$200 and \$500, depending on the ISP.

Australia's biggest ISP, Telstra BigPond, moved quickly to counter Unwired's pricing, slashing the cost of its dialup plans for the first six months of any 12-month contract.

Telstra now offers dialup plans starting at \$2.95 per month, through to an "ultimate" plan with unlimited time and downloads only costing \$12.45 per month. The offer is only for new customers, showing that BigPond is still trying to grow its dialup user base in the face of customer migration to broadband.

Meanwhile, Australian modem

manufacturers aren't worried by Unwired's strategy, even though the company's modems are sourced from the US. "Believe it or not, 56K modems are still a significant chunk of our business," said Netcomm's Michael Fitzgibbon. "There's a lot of people out there still on dialup."

1.5Mbit/s plummets in price

As more ISPs roll out ADSL2/2+ DSLAMs, many ISPs have dropped the price of first generation high speed 1.5Mbit/s ADSL services to below \$60.

There are now 10 plans offering more than 5GB of usage at 1.5Mbit/s speed, from aaNet, TPG, iPrimus, iiNet, Exetel, Cold Coffee Internet, Westnet and Internode.

The cheapest is aaNet's \$45 per month plan, which offers 8GB of usage. The best value is TPG's 20GB plan at \$49.95 per month.

Telstra blanket Wi-Fi

Telstra has announced it has turned the Sydney and Melbourne CBDs into giant Wi-Fi hotspots, with blanket 802.11b coverage. The telco giant has had base stations installed alongside mobile phone microantennae throughout the two cities.

However, Telstra will continue to operate "hotspot pricing" in the centres — charging for blocks of time, or requiring users to sign up to costly mobile Internet plans.

Its main advantage over other wireless providers is the ubiquity of Wi-Fi networking hardware in notebook PCs, but Personal Broadband Australia's Jim Cooney said iBurst can do with half a base station what Telstra has done with hundreds of base stations.

Your monthly guide to the best deals

APC is proud to partner with the independent broadband monitoring service Broadband Choice (<http://broadbandchoice.com.au>) to bring you the best broadband deals every month.

The comparison table on the following pages focuses on ISPs that best serve the majority of APC readers' needs. These include coverage in Melbourne, Brisbane and Sydney; 1300, 13 or 1800 telephone support.

We've only listed those that meet at least three of our four plan selection criteria:

- Budget plan: cheapest deal under \$30.
- Light plan: cheapest deal under \$65, with at least 512Kbit/s speed and 1GB data.
- Family plan: largest download allowance under \$90, at least 512Kbit/s and 5GB data.
- High speed: cheapest 1.5Mbit/s plan under \$160, with 4GB data minimum.

If an ISP has "unlimited downloads" but

speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as their limit.

We've picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest priced option was selected. The installation price doesn't include a modem because you'll generally get better value by buying one separately. See www.apcmag.com/web/_0/GetRouted/ for advice on choosing a modem/router.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet our selection criteria.

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details.

Data for the following table was extracted from the BroadbandChoice database on 3 March 2005.

BROADBAND DIRECTORY

Name	Phone	Online	Budget plan (under \$50)	Light plan (under \$55, minimum 108 data limit, at least 512Kbit/s)	Family plan (under \$50, minimum 508 data limit, at least 512Kbit/s)	High-speed plan (under \$50, minimum 408 data limit, at least 1.5Mbit/s)	National	Spam filtering	Setup fee
4.0 ADSL	1300 784 472	www.4net.net	\$13.95* 250MB 250Kbit/s	\$42.95* 508 512Kbit/s	\$42.95* 508 512Kbit/s	\$109.95* 508 1.5Mbit/s	✓	100	\$121 3mths
adsl	1300 800 092	www.adsl.com.au	\$29* 512MB 250Kbit/s	\$29* 108 512Kbit/s	\$30* 250 512Kbit/s	\$49* 608 1.5Mbit/s	✓	15	\$88 6mths
ADP Unlimited	1339 88	www.adp.com.au	\$29.95* 200MB 250Kbit/s	\$39.95* 1208 512Kbit/s	\$39.95* 1208 512Kbit/s	\$89.95* 1208 1.5Mbit/s	✓	6	\$149 1mth
AlphaNet	1300 360 518	http://home.alpha.net.au	\$29.95* 200MB 250Kbit/s	N/A	\$39 3008 512Kbit/s	\$99 3008 1.5Mbit/s	✓	5	\$121 6mths
Arise Voice & Data SDSL	1300 555 130	www.arise.com.au	\$29.95* 108 512Kbit/s	\$29.95* 108 512Kbit/s	\$69.95* 508 512Kbit/s	\$109.95* 508 1.5Mbit/s	✓	1	\$10 12mths
AussieNet Internet	1300 556 491	www.aussienet.com.au	\$39.95 3008 512Kbit/s	\$39.95 3008 512Kbit/s	\$39.95 3008 512Kbit/s	\$99 3008 1.5Mbit/s	✓	4	\$132 6mths
Australia Internet Solutions	1300 887 877	www.asic.net.au	\$24.95* 200MB 250Kbit/s	\$39.95* 508 512Kbit/s	\$44.95* 508 512Kbit/s	\$139.95* 508 1.5Mbit/s	✓	5	\$125 6mths
Australia Internet	1800 286 871	www.ausnet.net	N/A	\$39.95 2508 512Kbit/s	\$44.95 2508 512Kbit/s	\$99.95 2508 1.5Mbit/s	✓	25	\$129 1mth
AusNet ISP Home broadband	1300 788 513	www.ausnet.com	\$24.95* 200MB 250Kbit/s	\$39.95 2508 512Kbit/s	\$44.95 2508 512Kbit/s	\$99.95 2508 1.5Mbit/s	✓	5	\$129 1mth
Big Blue	1300 191 789	www.bigblue.net.au	\$24.95* 500MB* 250Kbit/s	\$49.95* 408 512Kbit/s	\$69.95* 2008 512Kbit/s	\$79.95* 508 1.5Mbit/s	✓	5	\$159.5 6mths
Bif Billion	1300 444 388	www.bifbillion.com.au	\$29.95* 200MB 250Kbit/s	\$39.95* 108 512Kbit/s	\$89.95 3008 512Kbit/s	N/A	✓	8	\$49 12mths
BT.net	1300 248 518	www.bt.net.au	\$29.95* 600MB 250Kbit/s	\$44.95 608 512Kbit/s	\$44.95 3008 512Kbit/s	\$79.95 608 1.5Mbit/s	✓	5	\$9 6mths
Broadband	1300 797 774	www.broadband.com.au	\$29* 250MB 250Kbit/s	\$49* 608 512Kbit/s	\$79.95 512Kbit/s	\$89* 1608 1.5Mbit/s	✓	10	\$129 6mths
Broadband	1300 452 47	www.broadband.net.au	\$29.95* 200MB 250Kbit/s	N/A	\$79.95 1508 512Kbit/s	\$129.95 2508 1.5Mbit/s	✓	10	\$149 6mths
BT ADSL	1300 130 720	www.broadband.com.au	\$29.95* 200MB 250Kbit/s	N/A	\$49 3008 512Kbit/s	\$129.95 2508 1.5Mbit/s	✓	100	\$129 6mths
Broadband	1300 137 654	www.broadband.net.au	\$27.95* 200MB 250Kbit/s	\$49.95* 308* 512Kbit/s	\$89.95* 1208* 512Kbit/s	\$99.95 1608* 1.5Mbit/s	✓	5	\$150 6mths
Charter Broadband	1300 222 256	www.charter.net.au	\$29.95* 200MB 250Kbit/s	N/A	\$89.95 508 512Kbit/s	\$119.95 508 1.5Mbit/s	✓	5	\$149 1mth
Charter broadband	1300 137 425	www.charter.net.au	\$29.95* 500MB 250Kbit/s	\$59.95* 1208 512Kbit/s	\$79.95 2008 512Kbit/s	\$85.95* 1208 1.5Mbit/s	✓	5	\$110 6mths
Cable ADSL	1300 314 441	www.cable.com.au	N/A	\$49.95 1008 512Kbit/s	\$49.95 1008 512Kbit/s	\$99.95 1008 1.5Mbit/s	✓	5	\$99 6mths
Connet Internet	1300 100 224	www.connet.com.au	\$22.95* 200MB* 250Kbit/s	\$49.95* 408* 512Kbit/s	\$79.95 1608 512Kbit/s	\$89.95* 1008* 1.5Mbit/s	✓	5	\$99 6mths
CompassNet	1300 461 317	www.compassnet.net	N/A	\$49.95 2508 512Kbit/s	\$89.95 3508 512Kbit/s	\$89.95 3508 1.5Mbit/s	✓	50	\$125 6mths
Cool Internet	1300 135 908	http://cool.com.au	N/A	\$39.95 2508 512Kbit/s	\$49.95 3508 1.5Mbit/s	\$69.95 5508 1.5Mbit/s	✓	5	\$129 1mth
CyberNet ADSL	1300 170 082	www.cynet.com.au	\$15.95* 200MB 250Kbit/s	\$39.95 508 512Kbit/s	\$59.95 508 512Kbit/s	\$89.95 1608 1.5Mbit/s	✓	30	\$119 6mths
DART Residential	1300 355 113	www.dart.net.au	\$29.95* 200MB 250Kbit/s	\$55 408 512Kbit/s	\$90 2408 512Kbit/s	\$95 408 1.5Mbit/s	✓	5	\$143 1mth
DCSI	1300 665 975	www.dcsi.com.au	\$29.95* 200MB 250Kbit/s	N/A	\$79.95 3008 512Kbit/s	\$129.95 2508 1.5Mbit/s	✓	6	\$125 6mths
Digiplex	13 34 41	www.digiplex.com.au	\$24.95* 300MB 250Kbit/s	N/A	\$74.95 1008 512Kbit/s	\$99.95 1008 1.5Mbit/s	✓	5	\$129 1mth
Dynanet Internet	1300 063 400	www.dynanet.net.au	\$29.95* 200MB 250Kbit/s	N/A	\$79.95 1008 512Kbit/s	\$119.95 508 1.5Mbit/s	✓	5	\$129 1mth
Dodo	13 13 02	www.dodo.com.au	\$24.95* 200MB* 250Kbit/s	\$39.95* 108* 512Kbit/s	\$74.95 1008 512Kbit/s	\$99.95* 1008* 1.5Mbit/s	✓	5	\$129 6mths
E-Access	1300 138 800	www.e-access.com.au	N/A	\$39.95* 1208 512Kbit/s	\$79.95 1208 512Kbit/s	\$109.95* 608 1.5Mbit/s	✓	5	\$139 6mths
E-DSL	1300 367 258	www.eisrael.net.au	N/A	\$54.95 508 512Kbit/s	\$74.95 508 512Kbit/s	\$99.95 508 1.5Mbit/s	✓	5	\$129 6mths
E-Net Communications	1800 733 888	www.e-net.com.au	N/A	\$54.95* 508* 512Kbit/s	\$76.95 508 512Kbit/s	\$99.95* 1008* 1.5Mbit/s	✓	10	\$148 6mths
Enquire ADSL Service	1300 731 368	www.enquire.net.au	N/A	\$44.95* 208 512Kbit/s	\$69.95 1008 512Kbit/s	\$79.95* 508 1.5Mbit/s	✓	1	\$129 3mths
Enquire Home ADSL	1300 739 455	www.enquire.com.au	\$29.95* 200MB 250Kbit/s	N/A	\$49.95 1008 512Kbit/s	\$89.95 1008 1.5Mbit/s	✓	5	\$129 6mths
Enquire Internet ADSL	1300 639 342	www.enquire.net.au	\$29.95* 200MB 250Kbit/s	\$50 108 512Kbit/s	\$69.95 1008 512Kbit/s	\$99.95 1008 1.5Mbit/s	✓	25	\$89 6mths
Enquire Technology ADSL	1300 784 440	www.enquire.com.au	N/A	\$44.95 2508 512Kbit/s	\$69.95 1008 512Kbit/s	\$109.95 2508 1.5Mbit/s	✓	5	\$132 6mths
FrontierNet Internet	1300 723 051	www.finet.net.au	\$29.95* 200MB 250Kbit/s	N/A	\$69.95 3008 512Kbit/s	\$129.95 2508 1.5Mbit/s	✓	1	\$140.95 6mths
Gdy.net	1300 722 231	www.gdy.net	\$29.95* 1.5GB 512Kbit/s	\$44.95* 1.5GB 512Kbit/s	\$69.95 1608 1.5Mbit/s	N/A	✓	5	\$159 6mths
Global Data Centre	1300 130 710	www.globalnet.com	\$29.95* 300MB 250Kbit/s	\$44.95 208* 512Kbit/s	\$79.95 508 512Kbit/s	\$89.95 1608 1.5Mbit/s	✓	10	\$99 6mths
Giznet	1800 448 255	www.giznet.com.au	\$19.95* 1* 200MB 250Kbit/s	N/A	\$49.95* 1608 512Kbit/s	\$129.95* 1608 1.5Mbit/s	✓	5	\$149 6mths
Hi-Speed Communications ADSL	1300 722 260	www.hispeed.com.au	\$30* 200MB 250Kbit/s	\$49* 1.5GB 512Kbit/s	\$69.95 508 512Kbit/s	\$129.95* 1608 1.5Mbit/s	✓	3	\$130 1mth
HiSpeed Internet	1300 665 366	www.hispeed.com.au	\$24.95* 200MB 250Kbit/s	\$39.95* 108 512Kbit/s	\$69.95 1008 512Kbit/s	\$79.95* 508 1.5Mbit/s	✓	5	\$99 1mth

Key: * ISP charges excess usage fees when you exceed your download limit; † This price only available if bundled with long distance telephone from the ISP; + Additional download allowance available with this plan for use in off-peak periods; ^ ISP combines sent and received data when calculating usage.

1300 033 863	1300 033 863	www.hipwire.net.au	N/A	\$54.95* 1GB 512GB/s	\$39.95 25GB 512GB/s	\$39.95 35GB 1.5MB/s	✓	5	✓	\$39 12mb	✓
1800 025 297	Hypernet DSL	www.hypernet.net.au	N/A	N/A	\$79.95 No limit 512GB/s	\$129.95 No limit 1.5MB/s	✓	5	✓	\$149.95 1mb	✓
13 93 77	13 93 77	www.net.net.au	\$29.95* 500MB 1.5MB/s	\$39.95* 2GB+ 1.5MB/s	\$39.95* 40GB+ 1.5MB/s	\$49.95* 10GB+ 1.5MB/s	✓	5	✓	\$99 6mb	✓
13 93 77	13 93 77	www.net.net.au	\$29.95* 500MB 8MB/s	\$39.95* 2GB+ 8MB/s	\$39.95* 40GB+ 8MB/s	\$49.95* 10GB+ 8MB/s	✓	10	✓	\$99.05 6mb	✓
1300 204 288	Independent Service Providers	www.isp.net.au	\$29.95* 300MB 250MB/s	N/A	\$59 No limit 512GB/s	\$149 No limit 1.5MB/s	✓	3	✓	\$120 1mb	✓
1300 201 222	Inspired Networking	www.inspired.net.au	N/A	\$39.95* No limit 512GB/s	\$39.95* No limit 512GB/s	\$39.95* No limit 1.5MB/s	✓	10	✓	\$132 12mb	✓
1300 199 69	Instant Communications DSL	www.icn.com.au	\$29.95 500MB 250MB/s	\$39.95 2GB 512GB/s	\$39.95 5GB 1.5MB/s	\$109.95 30GB+ 1.5MB/s	✓	5	✓	\$150 6mb	✓
1300 788 233	Interstate Home ADSL	http://radio.lanternet.net	N/A	\$39.95 2GB 512GB/s	\$49.95 5GB 1.5MB/s	\$89.95 16GB 1.5MB/s	✓	5	✓	\$129 6mb	✓
1300 788 233	Interstate Home ADSL	http://radio.lanternet.net	N/A	\$39.95 16GB 512GB/s	\$49.95 16GB 512GB/s	\$119.95 12GB 1.5MB/s	✓	5	✓	\$149 12mb	✓
1300 654 848	Prime Standard	www.primenet.com.au	\$19.95* 200MB 250MB/s	\$49.95 2GB 2MB/s	\$49.95 12GB 2MB/s	\$149.95 12GB 2MB/s	✓	5	✓	\$49 12mb	✓
1300 654 848	Prime Standard	www.primenet.com.au	\$20.95* 400MB 2MB/s	\$49.95 12GB 2MB/s	\$49.95 12GB 2MB/s	\$149.95 12GB 2MB/s	✓	5	✓	\$50 12mb	✓
1300 725 789	Stage Internet	www.stage.net.au	N/A	\$54.95 25GB 512GB/s	\$54.95 25GB 512GB/s	\$149.95 10GB 1.5MB/s	✓	10	✓	\$125 6mb	✓
1300 721 225	Line Net	http://line.net.au	N/A	\$44.95 1GB 512GB/s	\$79.95 40GB 512GB/s	\$149.95 30GB 1.5MB/s	✓	10	✓	\$125 6mb	✓
1300 134 638	Midwest Internet	www.midwest.com.au	\$29.95* 200MB 250MB/s	\$49.95* 6GB 512GB/s	\$79.95 No limit 512GB/s	\$189* 10GB+ 1.5MB/s	✓	5	✓	\$110 1mb	✓
1300 733 215	Netway Netnet DSL	www.netway.com.au	\$24.95* 200MB 250MB/s	\$49.95 5GB+ 512GB/s	\$69.95 20GB+ 512GB/s	\$79.95 5GB+ 1.5MB/s	✓	10	✓	\$109 6mb	✓
1300 730 125	Netscape Home ADSL	www.netscape.net.au	\$29.95 300MB 250MB/s	\$49.95 5GB+ 512GB/s	\$69.95 20GB+ 512GB/s	\$79.95 5GB+ 1.5MB/s	✓	10	✓	\$109 6mb	✓
1300 730 125	Optimix	www.optimix.com.au	\$29.95 300MB 250MB/s	\$49.95 5GB+ 512GB/s	\$69.95 20GB+ 512GB/s	\$79.95 5GB+ 1.5MB/s	✓	10	✓	\$109 6mb	✓
1300 730 125	Optimix	www.optimix.com.au	\$29.95 300MB 250MB/s	\$49.95 5GB+ 512GB/s	\$69.95 20GB+ 512GB/s	\$79.95 5GB+ 1.5MB/s	✓	10	✓	\$109 6mb	✓
1300 504 504	Optusnet Cable	http://roadbroadband.optusnet.com.au	\$29.95* 200MB 100MB/s	\$49.95 1GB 100MB/s	\$64.95 12GB 100MB/s	\$129 25GB 1.5MB/s	✓	100	✓	\$135 6mb	✓
1600 514 504	Optusnet DSL	http://roadbroadband.optusnet.com.au	\$29.95* 200MB 250MB/s	\$49.95 1GB 100MB/s	\$64.95 12GB 100MB/s	\$129 25GB 1.5MB/s	✓	100	✓	\$135 6mb	✓
1300 486 996	Optusnet (Not Unlimited)	www.optusnet.com.au	\$29.95 200MB 250MB/s	\$49.95 1GB 100MB/s	\$64.95 12GB 100MB/s	\$129 25GB 1.5MB/s	✓	5	✓	\$99 12mb	✓
13 35 93	Ordnal (Fixed Broadband)	http://thornhill.service.ironhill.com.au	\$29.95 300MB 250MB/s	\$49.95 12GB 512GB/s	\$79.95 10GB 512GB/s	\$120 10GB 1.5MB/s	✓	5	✓	\$59 12mb	✓
1300 134 081	Reference Residential ADSL	www.refnet.com.au	\$24.95* 200MB 250MB/s	N/A	\$69.95 12GB 512GB/s	\$120 10GB 1.5MB/s	✓	15	✓	\$119 6mb	✓
13 36 30	Pacific Business DSL	www.pacific.net.au	N/A	\$44.95 5GB 512GB/s	\$79.95 10GB 512GB/s	\$99.95 5GB 1.5MB/s	✓	5	✓	\$99 12mb	✓
1300 558 888	People Telecom Unlimited ADSL	www.peopletelem.com.au	\$29.95 1GB 250MB/s	\$49.95 10GB 512GB/s	\$59.95 20GB 512GB/s	\$79.95 10GB 1.5MB/s	✓	10	✓	\$99 12mb	✓
1300 558 888	People Telecom Flexible ADSL	www.peopletelem.com.au	\$24.95 300MB 250MB/s	\$49.95 10GB 512GB/s	\$59.95 20GB 512GB/s	\$79.95 10GB 1.5MB/s	✓	10	✓	\$99 12mb	✓
1800 245 777	Prime ADSL Standard	www.primenet.com.au	\$24.95 300MB 250MB/s	\$49.95 2GB 2MB/s	\$49.95 12GB 2MB/s	\$119.95 12GB 1.5MB/s	✓	7	✓	\$149 3mb	✓
1600 245 777	Prime ADSL 200MB	www.primenet.com.au	\$24.95 300MB 250MB/s	\$49.95 2GB 2MB/s	\$49.95 12GB 2MB/s	\$119.95 12GB 1.5MB/s	✓	7	✓	\$149 3mb	✓
1300 785 782	Qconnect ADSL	www.qconnect.net.au	N/A	\$39.95* 4GB 512GB/s	\$69.95 25GB 512GB/s	\$109.95 10GB 1.5MB/s	✓	5	✓	\$129 1mb	✓
1300 785 001	REDIS.NET Internet Services	www.redis.net.au	N/A	\$36.40* 4GB 512GB/s	\$74.25 No limit 512GB/s	\$149.25 24GB 1.5MB/s	✓	5	✓	\$125 6mb	✓
1300 554 687	Snapnet ADSL	www.snapnet.com.au	N/A	\$44.95 25GB 512GB/s	\$89.95 35GB 1.5MB/s	\$149.95 35GB 1.5MB/s	✓	5	✓	\$99 12mb	✓
1300 735 623	SPiRited Broadband	www.spirited.com.au	\$22.95* 200MB+ 250MB/s	\$47.95* 4GB 512GB/s	\$73.95 No limit 512GB/s	\$97.95* 15GB 1.5MB/s	✓	25	✓	\$139 6mb	✓
1300 303 275	Spin Internet	www.spin.net.au	N/A	\$39.95 4GB+ 512GB/s	\$73.95 4GB+ 512GB/s	\$139.95 5GB+ 1.5MB/s	✓	5	✓	\$99 6mb	✓
1300 488 090	SpeedDSL	www.speednet.com.au	N/A	\$44.95* 4GB 512GB/s	\$64.95 No limit 512GB/s	\$99.95* 20GB 1.5MB/s	✓	5	✓	\$100 6mb	✓
1300 344 841	Teleset ADSL	www.teleset.net.au	N/A	\$49.95 10GB 512GB/s	\$79.95 10GB 512GB/s	\$149.95 10GB 1.5MB/s	✓	10	✓	\$99 2mb	✓
1300 721 132	Telnet Internet ADSL	www.telnet.com.au	N/A	\$39.95 25GB 512GB/s	\$69.95 35GB 1.5MB/s	\$149.95 35GB 1.5MB/s	✓	10	✓	\$99 2mb	✓
1300 369 888	Tel Pacific	www.telnet.com.au	N/A	\$39.95 16GB+ 512GB/s	\$73.95 No limit 512GB/s	\$139.95 14GB+ 1.5MB/s	✓	5	✓	\$129 6mb	✓
13 12 82	Telstra Broadband Cable	www.broadband.com.au	\$29.95* 200MB+ 100MB/s	\$39.95 10GB+ 100MB/s	\$69.95 10GB+ 100MB/s	\$109.95 10GB+ 1.5MB/s	✓	1	✓	\$125.0m 188 3mb	✓
13 12 82	Telstra Broadband ADSL	www.broadband.com.au	\$29.95* 200MB+ 250MB/s	N/A	\$39.95 10GB+ 512GB/s	\$109.95 10GB+ 1.5MB/s	✓	1	✓	\$99 12mb	✓
1300 360 655	TPI Internet	www.tpi.com.au	N/A	\$49.95 20GB 1.5MB/s	\$79.95 No limit 512GB/s	\$149.95 20GB 1.5MB/s	✓	20	✓	\$129 6mb	✓
1300 854 824	Tropical Net Internet ADSL	www.tropicalnet.com.au	\$29.95* 300MB+ 250MB/s	N/A	\$79.95 32GB+ 512GB/s	\$119.95 32GB+ 1.5MB/s	✓	5	✓	\$79 6mb	✓
1300 760 960	TSN Internet ADSL	www.tsn.com	\$29.95* 300MB 250MB/s	\$39.95 1GB 512GB/s	\$79.95 5GB 512GB/s	\$109.95 24GB 1.5MB/s	✓	100	✓	\$129 6mb	✓
1300 557 360	Telnet ADSL Prime	www.telnet.com.au	\$21.95* 200MB 250MB/s	\$49.95* 1.5GB 512GB/s	\$89.95 No limit 512GB/s	\$179.95 4GB 1.5MB/s	✓	5	✓	\$125 12mb	✓
1300 660 869	Ventel Australia	www.ventel.com.au	\$29.95* 250MB 250MB/s	\$49.95 25GB 512GB/s	\$89.95 25GB 512GB/s	\$119.95 6GB+ 1.5MB/s	✓	20	✓	\$99 6mb	✓
1800 202 012	Web Ace	www.webace.com.au	\$29.95* 250MB 250MB/s	\$39.95 1GB 512GB/s	\$79.95 30GB+ 512GB/s	\$119.95 30GB+ 1.5MB/s	✓	6	✓	\$149 12mb	✓
13 19 40	Westnet Home ADSL	www.westnet.com.au	\$29.95* 200MB 250MB/s	N/A	\$49.95 12GB 512GB/s	\$109.95 35GB 1.5MB/s	✓	1000	✓	\$149 12mb	✓
1300 130 453	WIS 5000 ADSL	www.wis.com.au	\$29.95* 200MB 250MB/s	N/A	\$49.95 12GB 512GB/s	\$109.95 35GB 1.5MB/s	✓	5	✓	\$119 1mb	✓
1300 784 866	Yak Networks	www.yak.com.au	\$29.95* 350MB 250MB/s	N/A	\$49.95 15GB 512GB/s	\$149.95 20GB 1.5MB/s	✓	5	✓	\$119 1mb	✓

Source: broadbandchoice.com.au. Published with permission.

WORKSHOP

Hands-on with hardware and software, plus bonus DVD content

Setting up your own Web server

Broadband and powerful software make running a home Web server more attractive than ever. *James Bannan* explains how to turn a PC into an active Internet host.

If you want someone to connect to your computer via the Internet, you need an IP address which maps to your domain name. Usually, ISPs allocate IP addresses dynamically, so your computer's external IP address changes regularly.

Users will need a way of finding the server no matter what the IP address is. So, you'll need either a broadband connection with a static IP address, or a static name to act as translator.

Most ISPs provide static IP addresses if required. However, if you're on a standard broadband connection, you'll need a dynamic DNS service for handling dynamic IPs. There are plenty of dynamic DNS service providers including: DynDNS (www.dyndns.org); No-IP (www.no-ip.com); DNS2GO (<http://dns2go.deerfield.com>); TZO DNS (www.tzo.com); DynIP (www.dynip.com); and ZoneEdit (www.zoneedit.com).

A lot of these sites offer a free, basic DNS service. Create an account and you'll be assigned a domain name, such as <http://yourname.dyndns.org>.

This name is registered on the DNS service's name servers. A tracking application must be run on your server to identify the current external IP address and log any changes back to your account. The name servers are constantly updated, and whenever

anyone attempts to connect to <http://yourname.dyndns.org>, the servers identify the latest IP address and forward the request.

To register your own domain name, you'll need to purchase the rights to one. There are a number of name types and extensions available.

For a commercial site, go for the standard commercial domain (.com.au), although there are several other domains you can select. Remember that the .org domain is reserved for charity and non-profit organisations.

Prices vary between different registrars, so shop around. Here's

a list to get you started: Australian Domain Name Registration Services (www.domainregistration.com.au); Enetica (www.enetica.com.au); Webcity (<http://domains.webcity.com.au>); and Melbourne IT (www.melbourneit.com.au). For a list of NZ registrars, go to .nz Registry Services (www.nzrs.net.nz).

Before signing up, check how much the dynamic DNS service charges to redirect traffic to your registered name. This is typically a small yearly fee since the service doesn't get any exposure, as it would with the free service. However, DNS services such as ZoneEdit provide free redirection for up to five registered names, including mail forwarding.

After purchasing a name, you'll need to transfer the responsibility for hosting the domain to the dynamic DNS service provider. This process typically takes around two to three working days.

THE NEED FOR SPEED

Once you've chosen a name, consider the bandwidth of your broadband connection. Each broadband connection has separate download and upload speeds. These are usually asymmetrical, with a slower upload speed than download speed — 512Kbit/s for download and 128Kbit/s for upload in a typical ADSL plan. Cable is also asymmetrical.

Most broadband users are only concerned with download speeds, which determine the rate at which information is pulled from the Web. However, when users connect to your server, the rate at which they can download is dependent entirely on your upload speed — their downloads are your uploads.

A connection with anything less than 128Kbit/s upload speed (about 12KB/s) isn't going to give visitors the best response times from your Web server. Also think about the cost and usage pattern of your connection — some broadband plans are based on overall usage rather than specific download/upload amounts. With these plans, such as Telstra's standard BigPond plans, 10GB per month means 10GB of traffic measured in both directions — not really suitable for a Web server with a lot of traffic.



Bonus DVD software

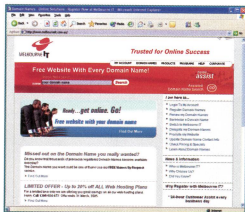
In "From the Mag" —
Cerberus FTP Server
2.22 (Windows) • Apache
2.0.53 (Win32 source)
• proftpd-1.2.10 (Linux).

Skill level

Intermediate

Requirements

Visual Basic.NET



Master of your domain: you'll need to sign up with a registrar like Melbourne IT to get your own domain name.

Other ISP plans only monitor the download stream and allow unlimited uploads. These are the best plans for home servers, as whatever visitors download won't count against your quota.

Before setting up a home server, check the terms of your ISP's Acceptable Use Policy. Some don't allow servers on home broadband accounts and run detection software across all accounts to check for this pattern of behaviour. If it's detected, your contract may be cancelled.

MAKING A CONNECTION

The first decision to make is whether to use the primary machine as the Web server, or set up a dedicated one. Both scenarios have their pros and cons.

Obviously, using the main machine means avoiding the expense of buying and running another one. Additionally, any incoming connections go straight to that machine — no configuration is required, making life much easier.

However, running a Web/FTP server from the primary machine means extra system overhead, which may have an impact on performance. For instance, you might be using Word or playing a game, during which the underlying Web services are increasing CPU load and hard disk read/writes.

Security is also an issue. In running an external service from a primary machine, you're essentially inviting outside users to connect to a computer which stores your

files, emails and personal information.

One advantage of running a dedicated server is segregation. This way, external users connect to a secondary PC rather than your personal machine, and firewall software can be used to increase internal protection even further.

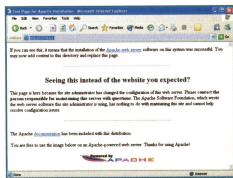
The other advantage is that high end hardware isn't required to run a home Web server. Older Pentium 2 or Celeron-based systems work perfectly well, except if server-side applications such as ASP or MySQL are hosted as they use more RAM and processing power. Even then, a Pentium 3-based system is more than adequate.

With a secondary machine, a degree of internal network management is required to forward external requests. The best way to achieve this is to purchase a broadband router.

The key features to look out for are Network Address Translation (NAT) and port forwarding. When a single machine is connected to the Internet, the external IP address is essentially the same as the address of that machine. Multiple machines on a local network still only have one external IP address but multiple internal addresses.

NAT handles outbound requests from internal clients and makes sure that information gets to the machine which requested it. An extension of this technology is port forwarding, where the router listens to incoming traffic on specific ports and directs the traffic to a specified internal address. In the case of an internal Web server, you'll need to configure port forwarding on the router to forward incoming traffic on port 80 (the default Web port) or 21 (the default FTP port) to the internal address of the server.

Using a dedicated hosting server and a router as a network intermediary is far more secure than hosting from the primary machine. Most routers come with a built-in firewall, so your network benefits from a layer of security before any external traffic gets in. A firewall on the server itself as well as the



Check one-two: the Apache test page confirms that the server is running.

Also in Workshop

106 Networking Printer sharing

Why dedicate a printer to one computer when you can share it around? *Stephen Withers* looks at the options.

108 Multimedia Re-synching audio

If a video file is badly rendered or corrupted, the audio track may lose synchronisation. *Daniel Winter* gets the two back together.

110 Security Intrusion detection

Unauthorised traffic is the bane of a network admin's existence. *Paul Schnackenburg* shows how Snort can help police it.

112 Linux Remote access

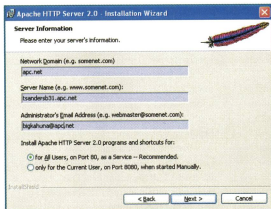
Caroline Leming and *Anton Tomazin* demonstrate three useful remote access options for Linux PCs.

116 Mastering Linux, part 6

The Linux equivalents of frequently used Windows programs are surprisingly familiar, as *Jarrod Spiga* explains.

118 Linux MySQL

Caroline Leming and *Anton Tomazin* demonstrate how to set up a basic MySQL database for a home Linux user.



Simply wizard: during setup, Apache prompts you for your network domain, server name and administrator's email address.

► main machine increases protection — having multiple levels of internal security is always a good idea.

There are many excellent free firewalls available, so there's no excuse not to implement one. However, the choice to be made here is between security and cost. If you're comfortable hosting from your main machine, don't want the bother of setting up an internal network, or just want to experiment with server software, there's nothing wrong with using a single machine. Just make sure you have an operational firewall as a basic level of protection.

FIRST SERVICE

One of the main criteria to look for when choosing an HTTP server is how many concurrent connections it can handle. Many people turn to Microsoft IIS for their first Web hosting experience because it comes bundled in Windows XP Professional (version 5.1), hosts both HTTP and FTP services, and handles ASP pages natively. However, it's really designed to help developers script pages, not host external Web sites, so it can only handle a maximum of 10 simultaneous connections (this is not the same as 10 concurrent users).

When your browser accesses a Web page, it opens a new connection, or thread, for every single item on that page — individual thumbnails, text blocks, CSS files and so on. You can easily open 20 to 30 threads accessing a standard Web page.

The 10-thread maximum on XP Professional means that for a Web page containing just a few items, external users will quickly run out of available threads and receive error messages instead. This not only reflects badly on the administrator, but it's intensely frustrating.

On the contrary, the 10-thread limitation isn't a problem for FTP sites. You can limit the number of concurrent FTP connections, so the restriction won't stop you hosting a perfectly functional FTP server on IIS.

There are plenty of other suitable server applications available, although three are included on this month's cover DVD, so start searching there.

Note that a registered domain name is accessible across all protocols — <http://yourname.com.au>, <ftp://yourname.com.au>, <https://yourname.com.au> and so on. The redirection and name resolution is automatic, you only need to worry about the back-end protocol and port configuration.

For flexibility, stability and power, it's difficult to go past Apache for hosting Web services. Apache ships with most major Linux distros, such as Fedora Core and Mandrake, but you can download the Apache source install for Windows (Win32) from this month's cover DVD, or for Unix-based systems at <http://httpd.apache.org>.

During setup you're prompted for the network domain, server name and administrator's email address. The email address isn't really important, but the other information is crucial. The server address is generally the hostname plus the domain name — server.yourname.com.au. The Windows installation asks whether you want to install it as a service. This option is recommended, as it installs on port 80 and is active regardless of who is logged on. Select Custom install and install all the available features.

TESTING, CONFIGURING AND EXTENDING

Once installed, Apache sits quietly in the system tray. You can check its status in the Service Monitor or in the available list of Windows services in Administrative Tools. To make sure it's running

properly, open your Web browser and enter the localhost address: <http://127.0.0.1>. The Apache Test Page should load.

The next test is to access the server from an external address. You may need to run this from an external machine — if you try to connect to <http://www.yourname.com.au> from an internal machine, the ISP will resolve this to your own external IP address. If you have a router, you'll connect to the router's Web

management page instead of the internal Web server, and port forwarding won't work. However, it should work if you have a single machine which handles the broadband connection, as the external IP address resides physically on the server.

On Windows, Apache is installed in `c:\Program Files\Apache Group\Apache2\`, and there's a well laid-out back end structure. The Apache2 folder represents the root folder and maps directly to www.yourname.com.au. For example, a file called `main.html` in Apache2 will map to <http://www.yourname.com.au/main.html>. The same goes for any subfolders.

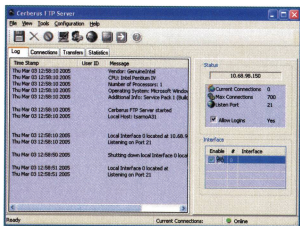
In the `conf` folder, you'll find the `httpd.conf` file — this is a text document which acts like an INI file for Apache. It's well documented, and there are heaps of configuration tips online — just do a Google group search. Any and all important server configurations are stored here, and it's the first and only file the server will reference. Any changes require the service to be restarted.

As always, keep a backup of this file in case any problems arise and refresh it when any changes are made. The same goes for hosted HTML files. Avoid editing the files in the root folder directly, as these are the live ones. Most HTML editors have the capacity for editing locally and uploading them to the live version.

Once the Web-side server is working, you can set up an FTP server. For Windows, Cerberus FTP Server 2.22 (on the cover DVD) is a good choice as it's free for personal use and very lightweight. On running the install, you'll be prompted to create an initial user, but you can create as many as you like in the Server Manager Configuration. Users that integrate with existing NT users can be created if you're running NT or 2000/XP, giving you extra control over who's accessing your files and their file permissions.

Cerberus FTP doesn't automatically install as an NT service, but this option can be set in Server Manager. Like Apache, it maps to a specific folder (the default is `c:\ftproot`). To test this, load your browser or FTP client and navigate to <ftp://ipaddress> (where the IP address is the actual address of the machine — the FTP service is address-specific, so the localhost address won't work).

Most major Linux builds have a built-in FTP server. However, try installing `proftpd-1.2.10` from the cover DVD. It's a free, industrial-strength FTP server with a text-based configuration system similar to Apache. Again, the configuration files are explained well and it has a huge online support base. www.proftpd.org



FTP for free: Cerberus FTP is a good, free, lightweight Windows FTP server.



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Network it!

Why dedicate a printer to one computer when you can share it around? *Stephen Withers* looks at the options.

Skill level

Intermediate

Requirements

LAN or print server
• network printer.

Time to complete

1 hour (approx)

Inside info

■ Gimp-Print for Mac OS X (with link to ESP Ghostscript)
<http://gimp-print.sourceforge.net/MacOSX.php3>

Printers are cheap these days, and sharing one or more across the LAN offers better value for money as well as more flexibility. A popular combination is a laser printer for monochrome work plus an inkjet for colour jobs. But how do you share printers? The most efficient way is to use the facilities built into the operating system. Windows, Mac OS and Linux all support this function.

WINDOWS XP

Once you've set up a printer under Windows XP, right-click on its icon in the Printers and Faxes window and choose Sharing. Click on Share this printer, note the share name (change it if desired) and click OK. A hand in the printer's icon indicates it's shared.

The Sharing dialog provides the option of installing drivers for other versions of Windows, but manually installing them on each computer that will use the printer is more successful.

If the shared printer is running a personal firewall, you may need to adjust its settings to allow other computers to access it.

Assuming the driver is already installed on the client computer, run the Add Printer Wizard. Click

on the Add a network printer button and hit Next. Click on Browse for a printer > Next, then double-click on the name of the computer hosting the printer to reveal its list of printers, and double-click on the name of the appropriate printer. If the driver for that printer isn't pre-installed, XP will attempt to download it from the sharing computer. Alternatively, you can install it in the usual way. Decide whether this should be the default printer, then press Next.

MAC OS

To share a Mac OS printer, open the Sharing system preferences, click the Services tab (if it's not already active), and check the Printer Sharing box. This automatically opens ports 515 and 631 in the standard firewall. You'll probably need to configure any third party firewalls which are installed.

The shared printer appear will then appear in the Printer pop-up menu of any other Mac OS X system on the network when a document is printed.

PRINT SERVERS

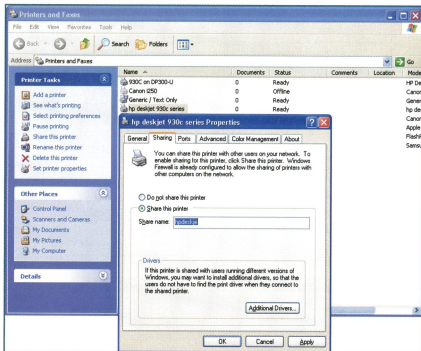
The main disadvantage of OS-based printer sharing is that the host computer has to be running whenever another system needs to print. Print servers overcome that problem as they're small, silent and consume little power, so they can be switched on permanently.

A D-Link DP-300U (\$289.95; www.dlink.com.au) was used in this Workshop, which provides ports for one USB and two parallel printers, and has a 10/100M Ethernet interface.

Installation was easy: connect the server to the network, plug in and turn on the printer(s), and connect the plug-pack.

Configuration was also very simple, thanks to the browser-based setup. However, there was one snag: the DP-300U's default address was 192.168.0.10, and our DHCP server was set to allocate addresses from 192.168.0.10 — some space was set aside for devices with fixed addresses, but the starting point was just too low. The solution was to change it to 192.168.0.11 and then renew the DHCP lease for the computer that had previously been assigned 192.168.0.10. The DP-300U's address is changeable, but only by communicating with it at the default address.

You'll need to use a Web browser to obtain the names assigned to the three ports. In this case, they were PS-10AACD-P1, -P2 and -U3. (Note that the illustration on page 2 of the DP-300U manual is incorrectly labelled: parallel port 1 is the one next to the USB connector.)



Share the love: four clicks is all it takes to share a printer.

Follow the manual's instructions for setting up a printer in Windows XP, but when you name the printer, include its location or at least an indication that it's connected to the print server. This might seem unnecessary on a small network, but you don't know how many network printers you'll end up with, and it's easier to implement a consistent naming scheme from the start. Is "HP Laser Jet (1)" in the study? "LaserJet Study" obviously is.

The DP-300U's manual says Mac OS X users are restricted to PostScript printers, but that's not true — the Gimp-Print drivers included with 10.3 will work via the print server. Run the Printer Setup Utility, click Add and choose Rendezvous from the pop-up menu. Hit the name of the port that the printer is connected to (PS-10AACD-P1, for instance). Next, pick the appropriate brand from the Printer Model pop-up menu and the model from the list that appears below. Consider upgrading to Gimp-Print 4.2.7, which includes additional Epson, HP, Canon and Brother drivers.

Print servers are sometimes built into other networking products such as the AirPort Express (see APC January, page 110) and various routers including the SMC Barricade 7004ABR.

NETWORK PRINTER

Perhaps the simplest way of sharing a printer on a small LAN is to buy a network printer. Inkjet and laser models are available; the network interface may be a standard feature or an optional extra.

As an example, a Samsung ML-2551N (\$1,295; www.samsung.com.au) laser printer is configured in this Workshop. While this model uses a conventional wired connection, a variant has built-in Wi-Fi support.

The default setting obtains an IP address by DHCP, but it's better to assign a fixed address to a network printer. Follow the manual's instructions — it's a model-specific process. It's unnecessary in an all-Mac network as the computers can locate the printer via AppleTalk.

For Windows XP, install the driver from the CD-ROM. This installs a local printer, which may come in handy at some stage. Since printing across the network is the aim here, go to Printers and Faxes > Add a printer > Next, then select Local printer even though it sounds counter-intuitive. Click Next.

Select Create a new port and set the type to Standard TCP/IP Port. Hit Next, and Next again. Type in the printer's IP address — you may add a suffix to the default port name to indicate the printer that connects to it. Click Next.

Select Custom > Settings > LPR protocol and enter a queue name. Click OK, then Next. Select the manufacturer and model, and hit Next. The driver is already installed, so select Keep existing driver and then hit Next.

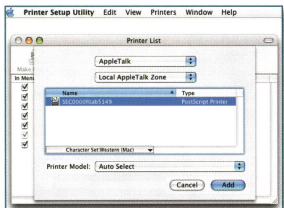
Give the printer a name that fits your scheme (such as "Samsung Study"). Select Yes if you want it to be the default printer and click Next. If you don't want to share this printer because everyone on the network can print directly to it, select Do not share... and click Next. Print a test page, then hit Next and Finish.

For Mac OS X, start by running the installer on the driver CD-ROM. This just adds the appropriate PostScript Printer Description (PPD) file.

In Printer Setup Utility, click on Add and choose AppleTalk from the top pop-up menu. The ML-2551N will appear in the list of printers as SEC000 followed by additional hex digits. Click on the SEC000 entry. If the message "Searching for new drivers" appears, just wait for it to disappear. Click Add and the new printer is ready to go.

A name like SEC000f0ab5149 isn't very friendly, so select the entry in the main Printer Setup Utility window and click Show Info. Change the name to something that fits your naming scheme, click Apply Changes and close the Printer Info window.

A new printer is automatically made the default, as indicated by bold text in the list



Auto-add: Networked PostScript printers such as the Samsung ML-2551N identify themselves to Printer Setup Utility.

of printers. If that's not what you want, select the correct printer and hit Make Default.

While sharing a local printer is the lowest-cost option, it's also the least convenient and the one that's most prone to problems. Setting up a print server or a network printer is preferable, unless you do very little printing or you're on an extremely tight budget. www.macosxhints.com

Crossing platforms

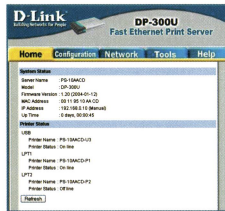
Cross-platform OS-based sharing can be problematic. It should "just work", but there are some problems.

Using a Mac printer from Windows
Give the Mac a fixed IP address. Enable Windows Sharing in the Sharing system preference. Create a new network printer in Windows at <http://<Mac's IP address>:631/printers/<printername>> (e.g., <http://192.168.0.4:631/printers/1250>).

For non-PostScript printers, select the Apple LaserWriter driver (Colour LaserWriter for a colour printer). Select the "real" driver only for PostScript printers (www.ifelix.co.uk/tech/3000.html).

A well-illustrated, step by step guide can be found at www.macosxhints.com/article.php?story=20040208122655345. Several different approaches are canvassed, so experiment to see which method works for you.

Using a Windows printer from Mac OS
Select Windows Printing when adding a new printer in Printer Setup Utility. Ensure the Mac is in the same workgroup (set in Directory Access) as the Windows PC; the Windows username you specify has a password (select a limited account used exclusively for printing); and a CUPS driver for the shared printer is installed on the Mac. For an explanation of the procedure required with 10.2, go to www.afp548.com/articles/Jaguar/cups-1.html.



Setting the server: D-Link's DP-300U print server is configured via a Web interface.

Dub wiser

If a video file is badly rendered or corrupted, the audio track may lose synchronisation. *Daniel Winter* gets the two back together.



Bonus DVD software

- VirtualDub 1.5.10
- VirtualDubMod 1.5.10.1
- Inmatrix Zoom Player 4.03

Skill level

Beginner

Requirements

VirtualDub 1.5.10

Time to complete

30 minutes (approx)

Inside info

- VirtualDub
<http://virtualdub.org>
- Zoom Player
www.inmatrix.com
- AVI Sync Info
<http://virtualdub.org/blog/pivot/entry.php?id=27>
- Doom9 Video Tutorials
www.doom9.org/index.html?guides.htm

There's nothing worse than discovering that a video file you've created has a soundtrack that's out of sync with the picture — especially if you've waited hours for it to render.

There are several reasons why an AVI file might lose sync, but you don't always have the luxury of recapturing or re-ripping from the original source material to fix it. Even if you have the original tape or disc, a few simple tweaks may be all that's needed to bring the sound back in line with the image.

Thankfully, VirtualDub 1.5.10 (included on this month's cover DVD) has a few functions which can automatically repair most sync problems. If these don't work, there are also some simple but time-consuming ways of manually reconstructing badly damaged files.

GETTING READY TO DUB

VirtualDub is an open source AVI video conversion and manipulation program. It's so popular that modified versions are also available that cater for MPEG, Ogg Media, matroska and more.

For this Workshop, the standard VirtualDub release was used. There is no installation procedure for VirtualDub, simply extract the ZIP file to a suitable location (such as C:\Program Files\VirtualDub). To create a shortcut for the program, drag the VirtualDub.exe file to the Windows start menu or the desktop.

ANATOMY OF AN AVI FILE

An AVI file usually consists of two streams, video and audio, although it can theoretically have more. Each stream has its own compression format (the codec) and a few other stream-specific properties. For

instance, the video stream's dimensions are specified in pixels — 720 x 576 and 768 x 576 are the most common formats for PAL video. The audio stream also has a sample rate, bit depth and mono/stereo properties — 44.1kHz/16-bit stereo is the most common. Video compression also uses keyframes, which can be thought of as maximum quality freeze frames, stored at regular intervals in the stream.

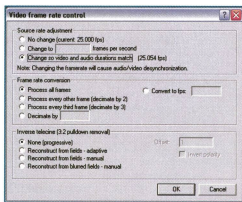
These are used as reference points so, rather than storing each frame as a series of images, video compression stores only the difference between the current and last keyframe to save disk space. Both the audio and video streams also have a data rate. For video, this is usually calculated as the average number of kilobytes per second (KB/s) of footage.

The data rate of audio is typically considered in kilobits per second (Kbit/s), which is commonly used to indicate the quality of MP3 files. When the two streams play back out of sync, it's usually due to one of three problems: the audio and video have different playback speeds; the audio isn't correctly interleaved with the video; or the audio uses a variable bit rate.

Each of these scenarios are usually easy to rectify. More extreme cases arise when the audio and video have been recorded on separate devices, or where the data is corrupt due to poor copying or processing. In these situations, manual repair is required. This is very time-consuming and often leads to imperfect results. Consider it only when the following solutions fail and the original source material is not available.

FRAME RATE MATCHING

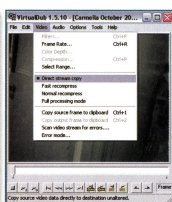
One of the most common reasons for audio playing out of sync with video footage in an AVI file is that the frame rate of the two streams slightly differs.



1 Select Change so video and audio durations match in the Video frame rate control window.



2 Tick Enable audio/video interleaving, and set the Audio block placement to Interleave audio on every frame.



3 To prevent the recompression of both streams, select Direct stream copy.

This often happens when converting DV footage to DivX, for instance, but it's easily fixed. Open VirtualDub then the problem video file. If the file contains a soundtrack with a variable bit rate (VBR), VirtualDub will analyse the source before loading the file. This automatically resolves the VBR problem.

When the video loads, the image is displayed twice, side by side. This is because VirtualDub displays the input video on the left and the output video on the right, simulating the process of dubbing between two VCRs.

If the preview area is too large to fit both windows onscreen simultaneously, right-click each pane and select 50% to reduce the display size. No transformations are performed in this Workshop, so both previews will appear identical.

1 Go to Video > Frame Rate to display the Video frame rate control window. This Workshop's sample DV footage was rendered to XviD with an MP3 audio track in Sony Vegas Video 5. The result is an AVI with a video frame rate of 25fps and an audio equivalent of 25.054fps. This is a tiny difference, but as the video progresses, the audio becomes further out of sync, so that after five minutes or so, the two seem completely unrelated. To fix this problem, select the button labelled Change so video and audio durations match, and click OK.

INTERLEAVING

2 Next, go to Audio > Interleaving to launch the Audio/Video Interleave window. Ensure the Enable audio/video interleaving checkbox is ticked, set the audio block placement to Interleave audio on every frame and click OK. The result can now be previewed within VirtualDub by clicking the playback arrow in the toolbar. If the audio sync appears correct, the synchronised AVI file is ready to be exported.

3 To prevent VirtualDub from recompressing the two streams, select Direct stream copy from the Audio menu, and then again from the Video menu. Export the AVI file by selecting File > Save as AVI. When VirtualDub finishes exporting the new file, play it to see whether the synchronisation problem is indeed fixed. In most cases, this is all it takes. If the sync is still poor — either in the VirtualDub preview or in the new file — a few more tweaks, such as offset correction, may help.

OFFSET CORRECTION

If frame rate adjustment and interleaving fail, you'll have to tweak the file by hand. If the soundtrack seems consistently out by a fixed amount of time throughout the file, skewing the audio stream forwards or backwards may resolve the problem. This is done in the same interleaving window used in step two, by entering a value in the Audio skew correction field. The value is in milliseconds; so if the audio appears to be a quarter of a second behind the image, enter -250. It may take a few tries to get this offset value right.

IF ALL ELSE FAILS...

If the problem still isn't fixed, you may need to resort to re-editing. Doing this accurately requires a timeline-based video editor such as Sony Vegas, Ulead Media Studio or Adobe Premiere. The process is simple but laborious.

First, import the material to separate video and audio tracks. Then, cut the audio stream into clips using peak events as cut points. By matching the audio events with the correct video frame, the video can be rebuilt scene-by-scene. Re-synching the streams manually is done by changing the start point of each audio clip and, if necessary, stretching it to match the end point with the correct video frame. Audio clips can be any length, but at least one per scene or camera shot is usually necessary.

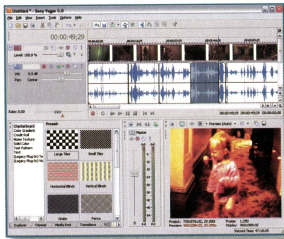
Although it's possible to import most AVI files directly into video editors, some programs will have trouble loading files of certain types, particularly DivX and XviD. In this case, try separating and/or re-encoding the streams — a process usually referred to as demultiplexing.

To export the audio from VirtualDub, go to File > Save WAV. This creates a standard decompressed WAV file that should be compatible with any video software. However, the video stream may need to be decompressed or recompressed.

Although decompression is the fastest and highest quality option, it requires a lot of disk space (about 30MB per second of video). Another codec can be selected, but putting the video through multiple compression formats can significantly reduce the quality of the image. This should only be done if the video editor refuses to load the video stream of the problem file.

To export a silent video file, go to Audio > No Audio, then go to Video > Full Compression Mode. Now open Video > Compression and the compression window will appear. From here, Uncompressed RGB can be selected or, if you don't have the disk space to accommodate it, a selection of other video codecs will be listed.

Some of the better options are MPEG-4, XviD, DivX, DV or MJPEG codecs. If these aren't available or simply won't load into your editor, Indeo compression with a quality setting of 90% can be used as a last resort. Once the audio and video streams are separated into individual files, load the timeline editor and get comfortable — there may be a few hours of precision tweaking ahead. <http://www.pc-mag.com>



Get comfy: when automatic sync correction fails and the original footage is unavailable, re-editing the streams in a timeline is the last resort.

Re-sync during playback

If re-editing an out-of-sync video file isn't your idea of fun, InMatrix Zoom Player (on the cover DVD) may be the solution. This media player has some great tweaks that can compensate for problem video files.

If you're watching a video in Zoom Player and notice the audio going out of sync, you can skew the audio track using the - (minus) key on the keyboard while holding down Ctrl (move forwards in time) or Shift (move backwards in time).

Since this is done in real time, you can adjust the synchronisation as necessary. This may not offer the smoothest viewing experience, but it will save a lot of time if all you want to do is watch a movie.

Safe and sound

Unauthorised traffic is the bane of a network admin's existence.

Paul Schnackenburg shows how Snort can help police it.



Bonus DVD software

In "From the Mag" —
WinPcap 3.0 • Snort 2.3
• IDScenter 1.1 RC4.

Skill level

Intermediate

Requirements

Windows 2000 Professional
or XP Professional.

Time to complete

1-2 hours (approx)

Inside info

- Snort documentation, FAQs, rules explanation and add-ons.
www.snort.org
- Construction and use of a passive Ethernet tap.
www.snort.org/docs/tap
- SnortSam — a Snort plug-in that allows for automated blocking of IP addresses in several firewalls.
www.snortsam.net
- IDScenter
www.engagesecurity.com

Many networks rely on firewalls for security. However, sneaking past one is usually pretty easy for hackers. Intrusion Detection Systems (IDS) are designed to give a real time warning when suspicious activity occurs. Snort 2.3 (included on this month's cover DVD), is an open source Network Intrusion Detection System (NIDS) that can give crucial insights about malicious traffic on a network.

Intrusion Detection Systems have been available for many years, although most are financially out of reach for small businesses and home networks. More affordable personal firewalls issue basic warnings when someone is trying to access your system, but they are limited to monitoring only one computer.

There are two main types of IDS on the market. A NIDS monitors the network and identifies suspect traffic based on rules or signatures, like an antivirus system. Advantages include being independent of the OS and the ability to detect attacks in real time before they affect host computers.

On the other hand, a host-based IDS examines event logs/syslogs for suspicious activity and can identify system-specific activities that a NIDS can't "see". It also deals with encrypted traffic more easily than a NIDS, since the packets are decrypted on the host. A host-based IDS requires no extra hardware as it's installed on existing servers.

PREPARATION

First, determine where to put the computer running Snort, known as the sensor. Placing it in front of the firewall sounds like a great idea, but throws up far too many useless alerts.

If your home or small business network runs a hub, just connect the Snort computer to that. If it's switched, check that it has a Switch Port Analyzer

(SPAN) to send all traffic passing through the switch to, or Snort will only see a limited amount of network traffic. Connecting Snort to a hub between the Internet router and the main network switch (if separate devices) can cause collisions in the hub segment, so it's only appropriate in small networks.

Alternatively, invest in a Tap, a network device that captures traffic for monitoring or IDS. There are even instructions on the Snort Web site (www.snort.org) for building your own.

The next step is hardening the Snort computer. Disable all non-essential services (see APC April 2003, page 140), rename the administrator account and give it a strong password. Then install the latest service pack and all security patches from Windows Update (<http://windowsupdate.microsoft.com>).

INSTALL AND GO

WinPcap, the packet capture library Snort relies on, is also included on this month's cover DVD. Install this first (a newer version may be available by the time you read this).

- 1 When you run the installation program, be aware that if the default folder (C:\Snort) is changed to C:\Program Files\Snort (or anything else with a space in it), all paths must be enclosed in quotation marks.
- 2 If you plan to log to SQL Server or Oracle, the client software must be installed prior to Snort.

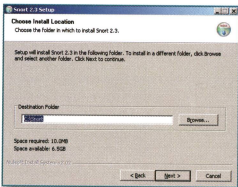
Once Snort is installed, go to the `snort.conf` file in the `\etc` folder. Note that command line switches in Snort are case sensitive.

Set `var HOME_NET` to the address range of the internal network. Multiple ranges can be specified — separate them with a comma but not spaces (for instance, `10.0.0.0/24,172.16.31.0/16`). Other machines can also be specified in the `var EXTERNAL_NET` line, but this is best left as `any`.

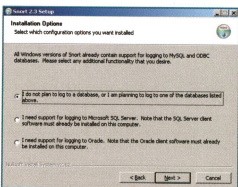
Different servers running in the one environment can be defined for Snort — for example, it makes no sense to scan for SQL injection attacks against a DNS server. Each server type has its own variable; just change those where required. Custom ports can also be defined — if you have an intranet server responding on port 8080 instead of 80, you can alter it with: `var HTTP_PORTS`.

FOLLOW THE RULES

Rules are the heart of Snort; they define what to look for in the packet stream. Sometimes called signatures, Snort ships with over 1,500 rules in several `rules` files in the `\rules` folder. Some are already disabled (they have # in front of the



1 Snort is installed to C:\Snort by default. If you wish to change this, the path must be enclosed in quotation marks.



2 If you want to use SQL Server or Oracle, rather than MySQL or ODBC, they have to be installed prior to Snort.

line). You can enable or disable a rules file in the `snort.conf` file, but enabling rules disabled by default generates a lot of noise.

If a rules file contains mostly useful signatures, you can comment out the individual unwanted ones within a rules file the same way as in `snort.conf`.

As with antivirus signatures, keeping rules up-to-date is vital, especially as new exploits are released. There's no automated way to update signatures from the Snort Web site, so new rules must be downloaded manually.

Aside from logging to a text file (`alert.ids`), Snort can log to MySQL, SQL Server, Oracle databases, and any ODBC-compliant database. The Event log can also be used.

To start Snort with the changes applied in `snort.conf`, go to the command line, change to the `\snort\bin` folder and type:

```
Snort -l c:\snort\log -c c:\snort\etc\snort.conf -A console
```

The `-l` part tells Snort where to store log files, `-c` indicates the location of the configuration file. To log to the Event log rather than the console, replace `-A console` with `-E`.

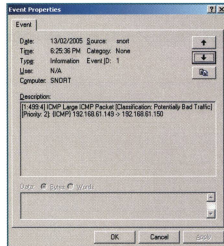
STAY ALERT

Ping the Snort sensor from another computer as follows: `ping -l 32767 ip_address`. This should generate an alert, as a large ping packet (32KB) is out of the ordinary.

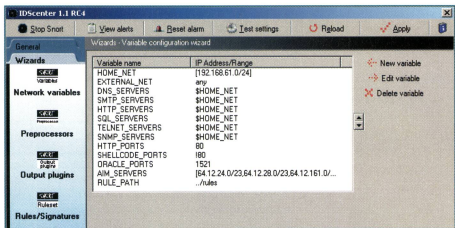
Check the screen if you opted to show alerts on the console. Alternatively, check the Event log to make sure Snort is working.

Now open the `icmp.rules` file in Notepad. The last line should read:

```
alert icmp $EXTERNAL_NET any >
$HOME_NET any (msg:"ICMP Large ICMP
```



3 Snort detects the presence of a large ping packet and alerts the user via Event log in this instance.



Looks familiar: IDScenter is a Windows front end that can also produce HTML reports and rotate/archive log files.

```
Packet"; dsize:>800; reference:
arachnids,246; classtype:bad-
unknown; sid:499; rev:4;)
```

This rule tells Snort to alert you when an *ICMP Packet* (ping) inbound from the external world to your network exceeds 800 bytes; to class it as *bad-unknown*; and that the rule has *sid:499* with revision 4. Since rules are plain text files, they can easily be customised.

GET ENGAGED

Engage Security's IDScenter is a Windows front end for Snort. Although it hasn't been updated since August 2003, it makes Snort more Windows-friendly and can produce HTML reports and rotate/archive log files.

Install it from the cover DVD and follow the prompts. Configure Snort and the `snort.conf` file fully before running IDScenter. Because of its age, it tends to put older configuration keywords in `snort.conf` if you use it for configuration rather than just as a front end.

Once Snort is running to your satisfaction, consider running it as a service rather than a user program. This means it runs whenever the Sensor is running, even if no-one's logged on. Just run Snort with your normal switches and add `/service/install`. IDScenter can also be used to configure Snort to run as a service.

HIDING FROM HACKERS

If a hacker realises that an IDS is running on a network, the first target will be the Snort sensor. One way of dealing with this is Stealth Mode. If remote access of the sensor isn't required, only use one network card. Otherwise use two network cards, one in Stealth Mode connected to the main network and another connected to a "secure" management network.

Follow these steps to configure the network card for Stealth Mode:

- Set a fixed IP address rather than "Obtain an IP address automatically". Go to Control Panel > Network Connections and right-click on the appropriate network interface, select Properties > Internet Protocol and put in any address and subnet mask.
- Start a command prompt, go to `C:\Snort\bin` and run `snort -W`. This lists all interfaces Snort can see, along with their hexadecimal identifiers (`B629D934-1DD5-47E2-800A-B19A48021162`, for instance). Note the ID of the interface that should be in Stealth Mode.
- Start Regedit and go to `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\Interfaces\{XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX}` where X is the interface in question.
- Double-click on the IP address key and delete the value.
- Delete the values for SubnetMask and DefaultGateway.
- Close the registry editor, start a command prompt, and run `IPConfig`. The interface should have `0.0.0.0` as the IP address and subnet mask. A restart may be required for the changes to take effect.

The NIC now listens on the network but is otherwise invisible. If you have more than one NIC, tell Snort which interface to listen on:

```
Snort -i 1, for instance, listens on the first interface listed when you type Snort -W.
```

POLICING THE TRAFFIC

Once Snort is running, monitor the event log frequently and get to know the specific alerts. Then finetune Snort and its rules so the amount of "noise" is limited, but warnings still filter through. IDScenter can be used to configure Snort to email alerts to you. [B11C](#)

Access all areas

Caroline Leming and Anton Tomazin demonstrate three useful remote access options for Linux PCs.



Bonus DVD software

In "From the Mag" —
OpenSSH 3.9 • VNC Free
Edition 4.1 for Linux (x86)
• VNC Free Edition 4.1
Viewer for Windows.

Skill level

Intermediate

Requirements

Networked system.

Time to complete

30 minutes (approx)

Inside info

- OpenSSH
- www.openssh.org
- RealVNC
- www.realvnc.com
- PuTTY: A Free Telnet/SSH Client
- www.chiark.greenend.org.uk/~sgtatham/putty

Setting up a Linux system to allow remote access is relatively easy — the toughest part is choosing which configuration to use. This Workshop covers some of the more common methods, including Telnet, SSH and VNC. The software and tools required for remote access are also explained.

CONFIGURING TELNET

Most distributions of Linux include Telnet server software. Telnet is an insecure protocol in that the data exchanged between the server and client isn't encrypted in any way, and it's relatively easy for a malicious user to capture authentication credentials. This is generally why it's installed, but disabled by default.

Telnet is controlled and run by an Internet services daemon called `inetd` or `xinetd`. Rather than having all servers such as Telnet start during initialisation and remain dormant until required, only the Internet services daemon is started at initialisation. This daemon listens on all service ports for the services listed in its config file and starts the appropriate server when a connection request is received. In this Workshop, `xinetd` is used to illustrate this.

1 To configure Telnet, simply go to the `/etc/xinetd.d/` directory and edit the telnet file. Change the line that says `disable = yes` to `disable = no`. Restart the `xinetd` daemon and the system will accept Telnet connections. To test the connection, Telnet to the localhost on your server. If everything is working correctly, you should be prompted for a username and password.

INSTALLING AND CONFIGURING SSH

Telnet has some disadvantages and should never be used to access a Linux server from a machine in an untrusted environment, such as the Internet. A better and more secure option is SSH, which provides a "Secure Shell" for access. OpenSSH 3.9 was used in this Workshop, and it can be downloaded from this month's cover DVD or www.openssh.org.

OpenSSH is a secure replacement for Telnet. It encrypts all traffic, including the login and password used to access the server, so that anyone eavesdropping or "snooping" on your connection is prevented from accessing the information.

Installing OpenSSH is easy. Uncompress the `openssh-3.9p1.tar.gz` file and change into the resulting directory.

2 To install with default options type:

```
./configure
make
make install
```

By default, this installs the OpenSSH binaries in `/usr/local/bin`, config files in `/usr/local/etc`, and locates the server in `/usr/local/sbin`. Use the `-p` prefix to specify a different location.

OpenSSH can be used immediately after a default install, but it's advisable to review the config to make sure all security requirements are covered before accessing the server from an insecure or untrusted environment.

To start the ssh daemon type:

```
/usr/local/sbin/sshd
```

```
root@pm1:~# cat /etc/xinetd.d/telnet
# default: on
# description: The telnet server serves telnet sessions; it uses \
#   unencrypted username/password pairs for authentication.
service telnet
{
    disable          = no
    flags            = REUSE
    socket_type      = stream
    wait            = no
    user            = root
    server           = /usr/sbin/in.telnetd
    log_on_failure   += USERID
}
```

1 Telnet comes included on most Linux distributions, and is easily turned on by toggling the `disable` line in the configuration file.

```
root@pm1:~# ./configure
Configuration files: /usr/local/etc
Adspass program: /usr/local/libexec/ssh-keypass
Manual pages: /usr/local/man/manX
FID file: /var/run
sshd default user PATH: /usr/sbin:/bin:/usr/sbin:/sbin:/usr/local/bin
Nmapge format: doc
PAM support: no
Kerberos support: no
S/KEY support: no
TTY wrappers support: no
MD5 password support: no
IP address in DISPLAY hack: no
Translate v4 in v6 hack: yes
BSD Auth support: no
Random number source: OpenSSH internal ONLY
Host: i686-pc-linux-gnu
Compiler: gcc
Compiler flags: -g -O2 -Wall -Wpointer-arith -Wno-uninitialized
Preprocessor flags:
Linker flags:
Libraries: -lcrypto -lutil -lz -lnsl -lcrypt
[root@pm1:~# openssh-3.9p1#
```

2 OpenSSH provides a "Secure Shell" for remote access to a Linux server by including the encryption missing from Telnet.

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▶ INSTALLING AND CONFIGURING VNC

Another way to access a Linux server remotely is through Virtual Network Computing (VNC). VNC software allows you to access the server machine using a simple "viewer" program on another computer. VNC is also free and can be downloaded from the cover DVD or www.realvnc.com/download.html.

This software allows you to bring up a remote X Window display. It also has the ability to display a remote graphical desktop over a standard network connection.

To install VNC, decompress the `vnc-40-x86_linux.tar.gz` change into the created directory and run the `vncinstall` script:

```
./vncinstall /usr/local/bin
```

This copies the programs into a specified directory (generally one in the `PATH` environment variable), and attempts to install the man pages in the correct directory.

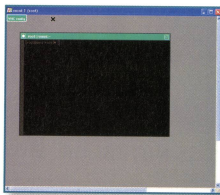
The `vncserver` command is used to start the VNC Server (Xvnc). The applications it can start are specified in `$HOME/.vnc/xstartup`, which can be tailored to suit requirements.

By default, it's set to run the TWM windows manager and a single xterm window. Therefore, each user who starts an Xvnc session may tailor the applications that start up for their remote session. To do this, enter:

```
vncserver
```

which will start the Xvnc server as the first available display (usually :1). For a list of other available options type:

```
vncserver -h
```



3 The Xvnc desktop can be accessed using a vncviewer. This is what it looks like on the default settings.

You can change settings such as the size of the desktop display and pixel depth in bits.

To kill an Xvnc display use the `-kill :<display number>` suffix. For instance:

```
vncserver -kill :1
```

USING VNC CLIENT TO ACCESS THE VNC SERVER

The application used to access the Xvnc desktop remotely on a Linux system, `vncviewer`, is included in the VNC package for Linux. To access it, enter:

```
vncviewer  
<name.of.remote.machine> :  
<display number>
```

which, for this example, would be `vncviewer linuxserver :1`.

■ If the Xvnc desktop is started with the default settings (leaving everything as default post-installation and typing `vncserver`), you should be able to see a desktop running the twm windows manager and a single xterm on the remote Linux server.

VNC Free Edition 4.1. Viewer for Windows (included on this month's cover DVD) can be used to set up a VNC Server on Windows.

To connect to the Linux server using the Windows Viewer, start up the application and type in the name of your Linux server and the display in the Server box, (`linuxserver:1`, for instance) and then click connect.

USING VNC WITH SSH

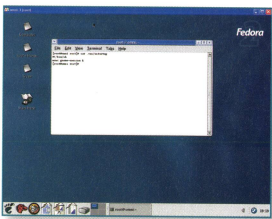
When logging in to VNC using the viewer, the password is encrypted — anyone monitoring your activities won't see the password in plain text. However, the rest of the display data isn't encrypted. Using VNC in conjunction with SSH, you can "tunnel" the VNC data through a more secure channel that is encrypted.

To do so, request the SSH client to listen on a particular port, and then forward data down the secure connection to a port on a machine at the other end. For instance:

```
ssh -L x:localhost:y anotherhost
```

This means: establish an `ssh` connection to `anotherhost`; listen on port `x` on the `local` machine; and forward any connections there to port `y` on `anotherhost`.

VNC generally uses port 59xx, where `xx` is the display number of the server. That is, if



Custom VNC: change the `$HOME/.vnc/xstartup` to `exec gnome-session &` and bring up a remote display running a Gnome Desktop.

display numbers 1 and 2 are used, it listens on ports 5901 and 5902. By forwarding these ports to another machine, the remote system appears as a server running on the local machine.

If a VNC server is running as `display:1` on a system called `linuxserver`, you can start a secure SSH session by typing:

```
ssh -L 5902:localhost:5901 linuxserver
```

Connecting to port `5902` on a `local` machine actually connects to port `5901` on `linuxserver`. To connect to `linuxserver`, type:

```
vncviewer localhost:2
```

rather than

```
vncviewer linuxserver:1
```

There are many other options for remote access under Linux and the only major concern with remote management is security. However, with a little research and exercising due vigilance, you can access your Linux server from anywhere in the world. ETITC

SSH Client for Windows

A good Telnet/SSH program to use to connect to your Linux server from a Windows client is PuTTY. It's available for download from www.chiark.greenend.org.uk/~sgtatham/putty. PuTTY has many great features, such as the ability to save connection settings and session logging. It's very simple to use and, perhaps best of all, it's free.

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Products of the month



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Skype is free software that allows the user to make free Skype-to-Skype calls and calls to landline phones around the world from approx 3c a min with no flagfall.
www.skype.com. MicroGrams USB phones feature full integration with Skype.
Cat 10165-1 Desktop \$129
Cat 10166-1 Mobile \$119
Cat 10167-1 Handset \$69



KVM Switches

Control Multiple PCs with one console (keyboard, monitor and mouse).
Cat 11654-1 Two Way \$99
Cat 11655-1 Four Way \$149
Cat 11656-1 Eight Way \$499



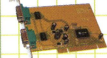
USB to Serial

Plugs into a USB port to provide multiple serial ports.
Cat 2826-1 One port \$54
Cat 2852-1 Two port \$119
Cat 2851-1 Four port \$349



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Cat 1008171-1 105 Key \$79



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Cat 3564-1 \$239



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These ADSL routers allow connection to multiple ISPs. Enhance reliability and increase your ADSL capacity.
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Cat 10139-1 Four ADSL feeds \$519



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EPROM Eraser

Combining good performance and low cost, this eraser accommodates up to 12 devices.
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Wireless PC Lock

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Mastering Linux, part 6

The Linux equivalents of frequently used Windows programs are surprisingly familiar, as *Jarrod Spiga* explains.

At this stage of the Mastering Linux series, you should be familiar enough with the basics to start tackling slightly more advanced tasks. This instalment looks at some Linux equivalents of frequently used Windows applications.

SUGAR-FREE SUITE

The strength of Microsoft Office is one of the main reasons for Windows' continuing popularity. The Office suite won't run under alternative OSes such as Linux, making many users hesitant to switch.

OpenOffice (www.openoffice.org) is an open source alternative to Office, with applications that do much the same thing and look strikingly similar.

Applications included in OpenOffice are:

- OpenOffice Writer — a word processor.
- OpenOffice Calc — a spreadsheet program.
- OpenOffice Impress — a presentation application similar to Microsoft PowerPoint.
- OpenOffice Draw — an image manipulation application for creating diagrams and illustrations.
- OpenOffice Math — an equation editor.

LAUNCHING

Quick launch buttons for the three most frequently used OpenOffice apps (Writer, Calc and Impress) are located on the default Fedora desktop. If you can't find what you're looking for, click on the GNOME button to reveal a program group containing all of OpenOffice's applications.

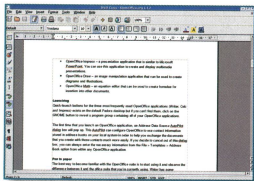
The first time an OpenOffice program is launched, the Address Data Source AutoPilot dialog box pops up. Here, you can configure OpenOffice to use address book information to exchange documents with those contacts. Alternatively, enter the necessary information in any OpenOffice app from the File > Templates > Address Book option.

PEN TO PAPER

The best way to become familiar with OpenOffice is to start using it. Writer has some differences to Microsoft Word that you'll notice right away. For instance, one of the toolbars appears on the left of the screen and a Paragraph Styles child window floats over your document.

The Paragraph Styles window is useful for formatting larger documents, but if the window gets in the way, press F11 to toggle its display status.

Many of Microsoft Word's features are found in Writer. Spelling and grammar mistakes are underlined and can be corrected by right-clicking the mouse. Working with tables in Writer is often



Word up! Using OpenOffice Writer is just as easy as using Microsoft Word.

easier than fiddling with them in Word. Adding comments is as simple as highlighting the affected text and selecting the function.

FONT SUBSTITUTION

Although the fonts are the same as Microsoft Word, most have different names under Linux. Writer's default font is called Nimbus Roman, the Linux equivalent of the Times New Roman serif font. Others (including Courier and Bookman) are identical to their Windows-based namesakes.

The X Windows GUI uses its own libraries, but you can still use your favourite Windows fonts. The Corefonts project (<http://corefonts.sourceforge.net>) is one utility which allows you to do so. Detailed instructions for implementing it are on the site, though the building process covers a number of topics that will be addressed later in this guide.

BRING OUT THE GIMP

You're not restricted to just creating Office documents in Linux. The GIMP (www.gimp.org) lets you create or edit images with professional-looking results. Launch it from Applications > Graphics.

The first time the GIMP loads, the main toolbox window appears. It contains the primary set of menus for the application and several icons representing the various tools at your disposal. To open an image or create a new one, click on the File menu and pick the desired option.

The relatively large space under the tool icons is reserved for the various options associated with each tool. For instance, when the rectangle select tool is used, its options are displayed.

When an image is opened or created, a second window pops up. Every image appears in its own window, allowing you to easily compare or share data between them. The maximum number of images which can be viewed simultaneously depends on your system specification.

Skill level

Beginner

Requirements

An installation of Linux (Fedora Core 3 was used in the writing of this article).

Time to complete

3 hours (approx)

In this series . . .

Part 5 — April '05
Working at the console

Part 6 — May '05
Applications

Part 7 — June '05
Console networking

... and more

LAYERS AND LAYOUT

Adobe Photoshop users know that one of its best features is the Layers Palette. The good news is that the GIMP also supports layers. Make a Layers dialog appear by selecting **Dialogs > Layers**, or by hitting **Ctrl+L**. Numerous other dialog windows are available, and can be managed via window docking — a single window that holds multiple dialog windows, with the contents of each dialog window accessible via a tab.

To create a window dock, select **File > Dialogs > Create New Dock > Layers, Channels and Paths**. A single window containing those three dialogs will appear. Additional tabs can be attached by clicking on the Tab menu button (the icon looks like an audio "Play" symbol) followed by **Add Tab**. From there, select the dialog windows you'd like to attach.

DEVELOPMENT

Even if you're not into development, the number of development tools automatically installed on a Linux system is staggering. Surprisingly, you'll use some of them when installing various applications.

Rather than under the GNOME menu, the development tools are buried in the file system, ready for use at the command line. With most of these tools, you'll only need to find them when they're required.

The only other thing that's needed for development is a text editor. The vi and emacs editors were covered in part 5 of this series (APC April, page 116), but a simple text editor is also included under the GNOME menu, in the Accessories group.

ALL WORK AND NO PLAY...

Fedora Core 3 ships with a number of games, a number of which can be played from the

desktop. A few action titles are also included.

It's also possible to get a number of Windows-based games running under Linux including the recently released Doom III (instructions on how to get it running can be found at <http://zerowing.idsoftware.com/linux/doom/>). Tux Games (www.tuxgames.com) is an online store where you can purchase a number of retail gaming titles plus their Linux wrappers/clients.

Alternatively, try The Linux Game Tome (www.happypenguin.org) or Linuxgames (www.linuxgames.com).

BACK TO THE INSTALLATION

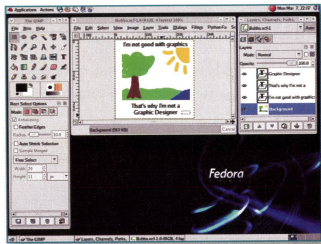
Fedora Core 3 (see APC January, page 98), offers the option of performing a Server or Personal Desktop installation. The Server option installs different applications and components to those included in a Personal Desktop installation.

Depending on which option you choose, it's possible some of the programs described here may not be installed. However, adding or removing apps from Fedora is fairly simple.

First, navigate to **GNOME > System Settings > Add/Remove Applications**. If you aren't logged in with root privileges, you'll be asked to enter the required credentials.

The Fedora Core 3 optical media contains hundreds of different applications. To make things easier to find, all apps are classified into a number of package groups. Each group contains a number of prerequisite applications that must be installed in order to install the optional programs. Installing or uninstalling the prerequisites is as simple as ticking or unticking the box next to the name of the program group. To select the optional components of a program group, click on the Details link for that group. Then choose the apps you'd like to install from the list.

For instance, the GIMP is classified under the Graphics



Easy to use: the GIMP is simple, yet powerful enough to create "masterpieces" like this.

program group. To install it, tick the box next to this program group and select **Details**. The Details window shows there are no prerequisite packages, and allows you to select optional components. From here, select the GIMP packages you want to install.

All the OpenOffice programs listed here can be installed from the Office/Productivity group. Development tools are located under various groups depending on the nature of the work (including Development Tools and X Software Development). Games can be found in Games and Entertainment.

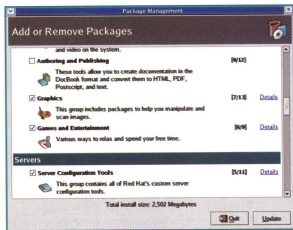
WHAT'S MISSING?

The biggest stumbling block you're likely to encounter when switching to Linux is that acquiring quality software in some categories seems impossible. Take accounting packages, for instance. There are a number of programs suitable for straightforward home finances, but there's nothing robust enough to fulfill the requirements of small business, let alone medium to large enterprises.

The good news is that most of these gaps are only in highly specialised areas, such as graphic design and CAD. As Linux use increases, the demand for these applications will also increase. And when that happens, some clever developer will fill those gaps and make these software packages available. And with any luck, they'll be open source too. www.linux.com

Next month...

Next month's Mastering Linux guide will look at the TCP/IP networking side of Linux from the command line, tricks that can also be used on a Windows PC.



A place for everything: Fedora categorises all applications into one of a number of different program groups.

Home base

Caroline Leming and Anton Tomazin demonstrate how to set up a basic MySQL database for a home Linux user.

If you don't use a database on a daily basis, the idea of configuring one on your PC can be daunting. But if the need for one arises, the MySQL database is freely available, easy to set up, and allows Linux users access to all the functionality of SQL.

INSTALLING AND CONFIGURING MYSQL

Most popular Linux distros include a version of MySQL and its additional related packages. For instance, Fedora comes with a package which includes scripts and benchmarking data used for performance tests, development packages, `mysql-jdbc` (a database interface for Java) and so on.

It's best to install most, if not all, of the MySQL packages for your chosen distribution of Linux. There's a good chance any application using the MySQL database will require some of the extra packages not included in the standard installation. Install MySQL from the distro-based binaries — it saves a lot of time and effort.

If your distro doesn't have the MySQL package, you can download a "generic binary" version from www.mysql.com. Alternatively, a MySQL source distribution is available. Installation is as easy as following the included instructions, and there's plenty of support available if you get stuck.

Once this is done, start the `mysqld` daemon using the appropriate method for your distro. If you've installed MySQL from source, enter:

```
bin/mysqld_safe &
```

To make sure MySQL is running, type:

```
ps -ef | grep mysqld
```

The configuration details are generally located in the `/etc/my.cnf` file. This file sets parameters such as the default database location. In most cases, it's not necessary to make any modifications since the file is small and straightforward. MySQL will run fine with the default settings, but the options can be tweaked when you become more familiar with the program.

While advanced users can be rather creative with the config, there's not much that's actually necessary for MySQL to run — once it's installed and started, you're ready to go. Just remember to restart it every time you make a change to the config file for the changes to take effect.

By default, MySQL databases are generally located in `/var/lib/mysql/<database>`, where `<database>` is the name of your database.

BASIC MYSQL ADMINISTRATION

To administer MySQL, you need to establish a root account, which is used to create and delete databases. Firstly, make sure MySQL is started, then set the root account password by typing:

```
mysqladmin -u root password  
<new-password>
```

This is best done on a new installation.

MySQL uses its own command line interpreter (CLI) to manage the database. Alternatively, the MySQL Control Center (`MySQLCC`) GUI tool is available from www.mysql.com/products/mysqlcc.

When using the CLI, just about everything entered into the MySQL command line must be finished with a semi-colon (;). Most successful commands will return a line similar to:

```
Query OK, 1 row affected (0.00 sec).
```

To access the command line, type:

```
mysql -u root -p
```

and enter the root password.

The command line (`mysql>`) should now be visible. To create a database, type:

```
create database <database name>;
```

To delete a database, type:

```
drop database <database name>;
```

To manually delete the folder with the name of the specific database, go into the directory where the databases are stored. This ensures the database is completely removed.

To list the databases (and check the deletion was successful), type:

```
show databases;
```

After creating a database, specify permissions for each user.

A special database called "mysql", which contains the username and password data for all users, can be used by the administrator to create users, set passwords and specify what information each user has access to. Permissions can be set using the `grant` command (except for root, as this user has automatic access to all databases) by entering:

```
grant all privileges on mydatabase.* to
```

Skill level

Beginner

Requirements

MySQL

Time to complete

1 hour (approx)

LAMP

The freedom and flexibility of open source solutions has led to many organisations utilising a combination of such software products. LAMP (Linux, Apache, MySQL and either Perl, PHP or Python) is quickly becoming a popular formula for success. Each product in the LAMP combination is a widely used, freely available software alternative and together form an inexpensive and well integrated answer to most companies' OS, server, database and portal needs.


```
user@localhost' identified by
'password';
```

This will set access for a user called **user** with the password **password** on the local server (**localhost**) to be given access to a database called **mydatabase**. Type:

```
flush privileges;
```

at the command line to write the changes into the "mysql" database.

RUNNING SCRIPTS

If MySQL is used for another application, it probably requires you to "create" a database for its integration, as well as populate the database with data. Luckily, all of this can be done from a script (usually) included with the application. Generally, all you have to do is create the database as the MySQL root user, then enter the appropriate command.

For example, to populate a database called **mydatabase** using a script called **mysql.script**, type:

```
mysql -u root -p mydatabase <
mysql.script
```

You're then prompted for the root account password.

TESTING

The best way to test the database is to log in as one of the created users — since root has unlimited access, logging in as root won't accurately test the permissions. At the command line, type:

```
mysql -u <username> -p <database
name>
```

to log in, and you should see the **mysql>** prompt. To check the desired databases were successfully created, type:

```
show databases;
```

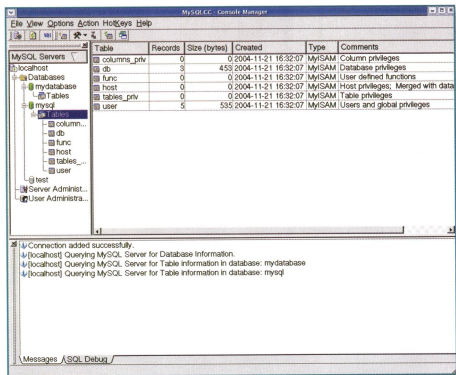
When listing the data tables in a database, the **use** command tells MySQL which database to look at:

```
use <database name>;
```

and then enter:

```
show tables;
```

To show the data fields used in a database, use **describe** followed by the table name:



Consolation: MySQLCC is a GUI tool that can be used to manage MySQL databases.

```
describe <table name>;
```

This lists the data fields used in this table in the current database. To view all data contained in this table, type:

```
select * from <table name>;
```

This common command to return the data from a table can also be limited to returning a particular number of rows. For instance:

```
select * from <table name> limit 1;
```

will return only the first row of the table.

BACKING UP AND RESTORING

To back up the database, use the **mysqldump** command:

```
mysqldump -u <username> -p<password>
<database> > <backup file name>.sql
```

Be careful to omit any spaces between **-p** and the **password**.

It's also important to backup the default **mysql** database, containing all the usernames and passwords. To restore a database from backup, type:

```
mysql -u <username> -p<password>
<database> < <backup filename>.sql
```

Make sure to restore the **mysql** database with the usernames and passwords, as this ensures that all authorised users can log in to the restored database.

If you have ongoing problems with the database you've created, check the log for errors before recreating the whole database from scratch:

```
/var/log/mysqld.log
```

CHANGING THE ROOT PASSWORD

Many users will use root access to install and configure MySQL, but once set up, they will commonly use one of the user accounts to access the databases. As it could be a long time between root logins, it's worth knowing the steps to change the root password in case it's forgotten.

Stop the MySQL daemon by killing the process, then restart in safe mode, skipping the grant tables (containing the database passwords):

```
safe_mysqld --skip-grant-tables &
```

Reset the root password by entering:

```
mysqladmin -u root flush-privileges
password *<new password>*
```

then restart MySQL. **EXIT**

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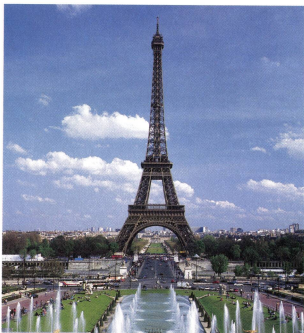
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Downtime

High-performance playtime

personal tech

Make it snappy

Dan Warne checks out the latest small, light cameras for capturing your life on the run.

Ricoh Caplio R1V

▲ **Upsides:** incredibly small for a 5 megapixel camera with impressive picture quality. On and ready to take shots in less than a second. Has a great, high-res LCD panel on the back and easy-to-use menus. Sleek, black, brushed metal case.

▼ **Downsides:** no USB 2.0, so you'll need a card reader to transfer the photos quickly (USB is the only option for the 12MB internal memory). Maximum resolution of 320 x 200 for MPEG-4 video, which is fine for Web use but not full screen.



Details	
Online	www.ricoh.com.au
Price	\$649
Verdict	★★★★☆

Samsung Miniket MP110

▲ **Upsides:** this tiny unit incorporates NTSC-resolution 30fps MPEG-4 video recording, a 1 megapixel digital still camera, MP3 player, voice recording, flash memory data storage and Webcam. Almost the same height and weight as a 20GB iPod, but twice as thick.

▼ **Downsides:** only takes Sony's expensive Memory Stick (1GB stick supplied). Still picture resolution is disappointing — more like a mobile phone camera than a real camera. No music format support other than MP3. It could be a great camera-slash-mobile... so near and yet so unable to make calls.



Details	
Online	www.samsung.com.au
Price	\$999
Verdict	★★★★☆

Cosonic CD-788V noise-cancelling headphones

▲ **Upsides:** cheap headphones that fully envelop your ear and do a good job of cancelling external noise like airconditioning or jet engine hum.

▼ **Downsides:** all the research and development money has been spent on the noise-cancelling adaptor. As a result, the actual sound reproduction is hollow and

lacks richness. The headphone cord features an intrusive and inelegant dangle that acts as the noise-cancelling microphone and circuitry.

Details	
Online	www.altech.com.au
Price	\$44
Verdict	★★★★☆

Sony PhotoVault MCS1

Running out of flash memory cards in the middle of a holiday is a perennial problem — especially if you're shooting hefty RAW files.

Sony's PhotoVault uses PictBridge to download photos from a digital camera and burn them to CD. It also has a built-in Memory Stick reader. Trouble is, it requires rare 8cm CD-Rs, which only store 210MB — so you'd run an equal risk of running out of

discs. In today's age of cheap flash memory, the PhotoVault MCS1 seems like it's had its day.

Details	
Online	www.sony.com.au
Price	\$399
Verdict	★★★★☆

Pokia: retro phones of the future

Do you lust for the era when picking up a phone was easier if you lifted weights three to five times a week? Do you miss the sweaty feeling that only an '80s Telecom Australia rotary phone handset can provide? If so, London-based retro-futuristic company Pokia (www.pokia.com) has the product for you: genuine old-school handsets which plug into Nokia mobiles. The salvaged handsets go for upwards of £150 and designer Nic Roope admits he may have stumbled onto the next big thing. And when he says big, he means plastic (even bakelite!) and chunky.



LEGEND

Downtime ratings

uber	Super, super cool
1337	Super cool
n00b	Uncool, (as in newbie)

Digital paper

Nobody likes piles of paper on their desk. Dan Warne is no exception.

i-rocks IR-8110 Aluminium 12-in-1 hub

Brushed aluminium surfaces, sleek form factor, and an incredible array of ports in a box the size of a MiniDisc player. It has three USB 2.0 ports, CompactFlash, SmartMedia, MMC, SecureDigital and Memory Stick slots, and a power adaptor to power devices attached to the USB 2.0 ports. But at \$75, it's twice as much as we'd want to pay.



Details

Online www.anyware.com.au
Price \$74.95
Verdict ★★★★★

Bikini Classroom for Windows XP

This bizarre CD training tool for Windows merges videos of scantily clad women with learning the basics of customising the taskbar and cleaning up the desktop. Lame '80s jokes about floppy disks aside, we can only assume it was created for the most craven of computer illiterates because the chicks aren't even hot, and half of them appear fully clothed. Ripped off!



Acecad DigiMemo A501

▲**Upsides:** write using an ink pen on normal paper (up to A5 size) and the pad beneath captures what you write as an image that can be downloaded to PC via USB, and then even sent by email. Like a Tablet PC, but at a fraction of the cost.



▼**Downsides:** you really need to buy the optional handwriting recognition pack (\$89) for this to be useful. Without it, you'll be stuck with a collection of non-searchable pages. Also, the unit requires special ballpoint pen cartridges, which may not be easy to come by if you lose the stylus.

Details

Online www.capaxtech.com.au
Price \$169
Verdict ★★★★★

Planon DocuPen R700

▲**Upsides:** the "pen" is a scanner that can roll down a page and capture it as an image, which the supplied software then turns into searchable text. Has potential to save students on photocopying costs and take corporate espionage into the mainstream. Recharges via USB.



▼**Downsides:** uses an internal USB-to-serial chip that downloads at 115Kbit/s. Only has a 2MB memory. Difficult to get a good quality scan if the scanner isn't run down the page at a precise speed. Maximum resolution of 200dpi in B&W. Software has an outdated feel reminiscent of Windows 3.1/95.

Details

Online www.citysoftware.com.au
Price \$299
Verdict ★★★★★

AVerMedia AVerTV DVB-T USB 2.0

▲**Upsides:** small, portable and attractive high definition digital TV tuner. Picks up free-to-air digital radio and TV, and includes a USB 2.0 cable, antenna, software and a TV-style remote. Watch full screen or in a window, record, timeshift or see a grid of 16 channels. Recorded shows can be automatically split into disc-sized chunks for easy burning. Use your desktop to

watch TV without the machine dramatically slowing down.

▼**Downsides:** the software's a bit dodgy. The windows have a wacky look, and while using the remote it's often difficult to tell whether the software isn't responding or the buttons aren't working.



Details

Online www.avermedia.com.au
Price \$169
Verdict ★★★★★

Connectland Mini 2.1in Notebook Speakers



▲**Upsides:** one cord does it all. The USB cord sources power from your notebook and also includes a built-in USB sound card, so there's no need to fiddle with a headphone lead. The two speakers and mini-woofer provide a surprisingly smooth and rich sound.

▼**Downsides:** they look odd, and the loudness

won't rattle your windows, but they're certainly better than most notebooks' built-in speakers. You have to use your computer to control the volume.

Details

Online www.citysoftware.com.au
Price \$49
Verdict ★★★★★

dynamic bass and audio clarity

quality speakers with a stylish design

surround sound with sub woofers

listen to the sound & feel the beat



dyna-bass earspeakers

Combining comfort and fashion with perfect sound reproduction

Eliminates background noise to ensure improved sound volume and tonal quality. advanced bass for superior listening pleasure.

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AO-EARS



2.0 stereo desktop speakers

Optimal sound balance for enriched audio definition and stereo clarity

Sleek tower design with magnetic shielding and built in controls for excellent sound at an affordable price.

SRP \$19.95
SPK-20



2.1 multimedia speakers

Clear sound with enhanced bass for crisp reproduction and low distortion

3 piece set (2 satellite speakers and 1 sub woofer) reinforced module with magnetic shielding and active separating circuits.

SRP \$49.95
SPK-21



5.1 home theatre speakers

Mind blowing sound and super bass for a complete sound system

6 clearly separated channels with digital decoder for realistic 5.1 channel sound. Thumping bass to feel the beat.

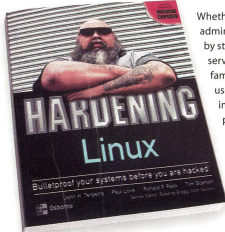
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SPK-51

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Hardening Linux



Details

Publisher	Osborne/McGraw Hill
ISBN	0072254971
Price	\$69.95

Whether you're a desktop Linux user or network administrator, *Hardening Linux* is an excellent step by step guide to implementing security on a Linux server or desktop. Although the authors assume familiarity with either Red Hat or SUSE LINUX, users of other Linux flavours (and Unix users in general) needn't worry as the guidance presented is universal.

The majority of this book is devoted to implementing preventative measures to avoid attacks in the first place — namely securing the network before establishing a connection to the Internet. The remaining chapters focus on implementing and enforcing a company security policy, installing and configuring firewalls, and mechanisms that can be employed to make things harder for hackers to penetrate. This includes logging and monitoring tools and file system encryption.

The information is well presented and the screen shots clearly and thoroughly demonstrate what

is explained in the text. Many sample configuration files are listed in their entirety and annotated. All of these approaches combine to help any Linux user or administrator discover whether their systems have been compromised and decide what action to take to remedy the problem.

As mentioned, familiarity with at least one of two of the more popular Linux distros and their installation is assumed. Yet, the authors often discuss items in more depth than is needed for experienced or advanced users. A second complaint is that distro-supplied daemons are described to help readers determine which ones can be disabled, but no dependency information is listed.

Hardening Linux comes into its own with its solid emphasis on balancing security concerns and practical trade-offs, giving expert guidance that will help readers make sensible decisions about security on a home or business Linux network. Consequently, this book is a winner.

David Williams

Windows XP Just the Steps for Dummies

Sometimes you're prepared to work through a book in order to learn about a piece of software, while at other times you just want a quick explanation of what you need to do to complete a particular task. *Windows XP Just the Steps for Dummies* does the latter, so if you need to know how to do something specific, such as add a contact to your address book, you'll find the necessary steps here.

That's not to say that the book sticks strictly to the basics. In fact, and despite its title, *Windows XP Just the Steps for Dummies* is better suited to those with at least some Windows experience — complete beginners might know they want to play Solitaire or adjust the volume level, for instance, but would they think about setting up Windows Firewall exceptions?

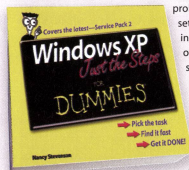
A variety of everyday tasks are presented and explained, from finding a file and organising Internet Explorer Favorites to using Windows Media Player and backing up files. Details on one-off

problems are also included, such as setting up an Internet connection, installing a printer and the features of SP2, along with hardware and software troubleshooting.

Windows XP Just the Steps for Dummies' landscape format works well, with text on the left and one or two relevant screen shots on the right of most pages. Some of the images are perhaps a little too small, though most have been adjusted to improve the clarity.

This is a useful and affordable book for relative newcomers to XP.

Stephen Withers



Details

Publisher	Wiley
ISBN	0764574809
Price	\$24.95

Degunking your Email, Spam and Viruses

There's no avoiding it: the signal to noise ratio of our Internet connections continues to fall due to the rising incidence of spam, phishing attacks, worms and viruses.

The good news is that *Degunking your Email, Spam and Viruses* is a comprehensive guide to dealing with these nasties. For instance, it provides clear strategies for keeping control of your email by culling the messages you don't really need, and organising and archiving those you do.

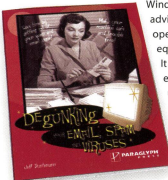
This book usefully identifies four categories of email user — public professional, private professional, student-enthusiast and casual communicator — and its information is tailored to their different needs.

The overall focus of *Degunking your Email, Spam and Viruses* is on Windows systems. However, much of the advice is equally applicable to other operating systems, though locating the equivalent utilities is left to the reader. It details how to filter and organise email, protect against viruses, clean up adware and spyware, and block worms with a firewall.

While readers may not agree with every aspect of the author's advice, it generally reflects differences of opinion rather than matters of fact. Generally, the

book is an excellent guide that will allow all but the lightest email users to recoup enough time to quickly justify the purchase price.

Stephen Withers



Details

Publisher	Paraglyph Press
ISBN	193211193X
Price	\$39.95

Beginning XML 3rd Edition

XML (eXtensible Markup Language) is regarded by some as a sort of magic technology that makes information easily accessible and portable. It's true that XML has helped previously uncooperative systems to interact, but some guidance is needed to harness such power.

With this in mind, *Beginning XML* starts with a broad overview of XML before drilling down into more specific technologies like XSLT, DTD, RSS, XPath, XHTML, CSS, SVG, SOAP and WSDL. It's aimed at users with a basic knowledge of HTML and Web development concepts, although it's still a very useful reference for experienced coders.

The book is split into two parts. The first discusses presenting and transforming XML, programming with DOM and SAX, validation and structure using DTDs or schemas, XML and databases, and XML RPC.

The second part is made up of three case studies covering an ecommerce site, a message board and a B2B application. These put the first part of the book in context and show practical use of XML.

But for such a universal technology the book is strangely Microsoft-centric, which could be a problem for those working primarily with non-Microsoft software or Java.

David Williams

Game Console Hacking

Xbox, PlayStation, Nintendo, Atari & Gamepark 32

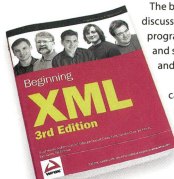
Although the title of this book makes it sound very promising, its projects cover varied territory. *Game Console Hacking's* first exercise thoroughly explains how to fit a PC into an Atari 2600 case — a nice project for those with fond memories of the late '70s, but doesn't this constitute case modding rather than a "console hack"?

Less than 20% of this title is devoted to current consoles, with around twice as much to old Atari and Nintendo models. The Xbox projects include illuminating controller buttons, adding a remote reset switch, and installing a mod chip.

The instructions are very clear, and anyone who's reasonably competent with a toolkit and a soldering iron should be able to follow most of them successfully, although there are a few steps which have the potential to ruin the console.

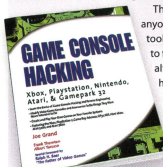
Ultimately, the problem with *Game Console Hacking* is that it covers so much ground that only those who own several of the systems described will get full value from this relatively expensive volume. Instructions for many of these projects can be found on the Web, though not always with the same clarity and detail.

Stephen Withers



Details

Publisher	Wrox Press
ISBN	0764570773
Price	\$66.95



Details

Publisher	Syngress
ISBN	1931836310
Price	\$74.95



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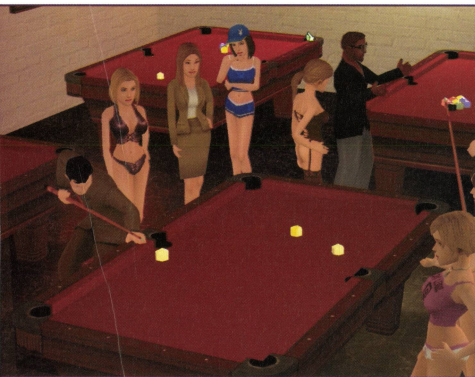
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Pocket billiards: this game renders TnA better than it does pool balls. Enough said.



Relief: Candy fled the spa when Ted refused to explain what he meant by "Ah, that's better!"



Dancing queens: Dylan and Boris found love in the games room, not The Grotto.

Playboy: The Mansion

Finally, a game worthy of the "lecherous millionaire overdosing on Viagra" simulator genre has arrived. *Justin Kranz* dons the silk PJs.

The lowdown

▲ **Upsides:** doesn't take itself seriously enough to be annoying; management aspect surprisingly diverting.

▼ **Downsides:** not as good as *The Sims*; relatively limited ranch factor.

Details

Contact	Ubisoft
Online	www.unleashyourbunny.com
Price	\$69.95
Verdict	★★★★☆

Your mission, should you choose to accept it, is to walk in the alligator loafers of Hugh Hefner. Not the current iteration, a fragile construct held together by Viagra and shareholders' will, but rather the Hugh of half a century ago — quick, enterprising and talented. Using your superior sim skills, you wheel, deal and influence others to build an adult empire that draws envy from your peers and recriminations from the Festival of Light and Family First.

Or at least, that was the plan. In reality, *Playboy: The Mansion* is more like *The Sims*, only not as smart or diverse. You issue commands via a context-based radial menu and try to amass contacts who can help you... publish magazines.

Let's get the big question out of the way first. Yes, you can get laid in the Mansion. In fact it's easily possible to talk your way into booty time within a few minutes of starting the game. But it's not the be-all and end-all of the game. In fact, it's kept pretty PG-rated, with Hugh retaining his boxer shorts at all times and the other parties remaining at least somewhat clothed. For the pervs out there, it's safe to say that it's likely to be an, um, anti-climax.

The "action" is rendered in that pulled-back iso-3D style revived by *The Sims*. It's not photorealistic, and it's not meant to be. You've got a job to do. Building the *Playboy* empire means you have to put out a mag every month, so your "life" consists of meeting people who can help you, hiring and firing staff, furnishing the Mansion and taking photos of nubile nymphs. In between you throw parties to meet celebrities who then add to your prestige while inducing hack journals to contribute articles to the mag. And yes, there's always plenty of female flesh around.

Your performance is measured by the success of your magazine sales, so e-pervs will enjoy the photo shoot parts of the game... though once you've seen one pixel-perfect nipple, you've seen them all. In fact, all the titillating aspects of *Playboy: The Mansion* tend to take a back seat to the endless cycle of introductions and pumping the talent for useful content for the mag.

If you're after a quick porn fix, you'd need your head read to pay for this game. If you're looking for a sim/tycoon game, there are also much better options around to choose from. However, *Playboy: The Mansion* is still a surprisingly worth playing, with enough management elements to make it a cut above a mere skin game.

Star Wars:

Knights of the Old Republic II: The Sith Lords

Oh, what temptation if The Force were a real phenomenon.

Star Wars: Knights of the Old Republic II: The Sith Lords gives you a chance to flex Jedi powers for more than just picking up at bars and conning SP bookies. And because gaming is midway through a period of free thought, you don't have to be a snivelling goody-two-shoes in this glossy RPG — you can be as bad as you like.

Sith Lords follows on from the first KOTOR. This time, the evil Sith are looking to whack you before you can reach your full potential as Jedi saviour. It starts off slower than a wet weekend, but the sheer size of this game — which can be completed in multiple ways — means things rapidly get better. Well, up to a point.

Moral choices in this game start off relatively clear-cut, but rapidly get murkier. It's a credit to the developers that the great original KOTOR storyline is pushed into some clever new directions. The only complaint is that perhaps there could be more of a tie-in between the plot and the unfolding morality play. Internal politics between your merry band is often a lot more fun, but applying a corrupting



Heart-Fett apology: "I'm not putting up emotional barriers baby, this is my favourite mask."



Electric Light Orchestra: Jedi sparkies compare fluorescent tube technology.

influence to those around you (or vice versa) is often more intriguing than digging into the storyline. Thanks to much improved group AI, it's actually worthwhile trying to mess with the CPU a bit.

The one slight let-down players will note is that the storyline gets quite predictable in the closing stages of the game — not a dramatic cut-off in terms of quality, but enough to diminish your opinion once the game is complete. It's not Armageddon, perhaps a lack-of-time issue.

Sith Lords is in every way an improvement on an already great game. Single player RPGs may be an oddity on a planet where World of Warcraft subscribers are a safe bet to top the million mark, but this is a fine effort. If you have room for a solo, Star Wars-themed adventure, this is the ticket.

Nexus:

The Jupiter Incident

Being a space ace isn't always fun. But at least in Nexus, it looks damn pretty.

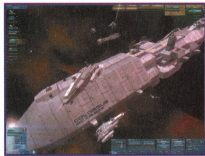
Wow, a 3D space exploration/battle game. Bet it has a plot that's about as fun as having a urinary tract infection, right? Hey, give it a chance. After all, remember Elite? It kicked much booty on such dated platforms as the Sinclair Spectrum, so it's not as if we haven't seen it all before.

In Nexus: The Jupiter Incident, we've seen it all before, but rarely in such an attractive composition. It's no revolution à la Elite, but for space cadets eager for some interstellar intrigue, it ain't half hot. The game looks stonkingly good and runs very smoothly — a nice feat given the humongous ships that can command decent regions of space.

This is no nerdy real time strategy space game. You're given a more personal level of control. Well, sort of. As the skipper of your ship, you have control over every aspect of its operations... through subordinates. You issue orders in relation to targets — what to hit and where — and give commands for manoeuvring, but there's a frequent pressing urge



Own goal: Earth's invasion was made easy when aliens tracked us down via SETI @Home.



Into the void: the USS Liberty sets off in search of Iraqi weapons of mass destruction.

to just fly the damn thing yourself. Which you can't. It's annoying, and there's often a decent amount of lead time between your orders being issued and action taken. But if you're willing to persevere, you'll fall comfortably into the role of taking responsibility while having no low-level impact on events.

The big question is, who this game will appeal to? Action gamers will dismiss it rapidly because of the detached control method. Strategists will scoff at the relatively basic sequencing of events — wear down the big foes one by one, then mop up the rest. It's a shame because this is a well-crafted piece of work. You can even take on other Nexus players in multiplayer... if you can find any. Nice try, but ultimately not a must-buy.

The lowdown

▲ **Upsides:** the great visual engine is predictably touched up, but the wealth of AI and influence-based improvements really are the highlights here.

▼ **Downsides:** a bit of a lazy opening sequence, but from then on it's gold.

Details

Contact	Electronic Arts
Online	www.lucasarts.com/games/swkotor_sithlords
Price	\$89.95
Verdict	★★★★★

The lowdown

▲ **Upsides:** seriously superior visual output that leaves you itching to assume direct control of your ship...

▼ **Downsides:** ...but the game mechanic prevents you from doing so.

Details

Contact	Vivendi Universal Games
Online	www.nexussthegame.com
Price	\$89.95
Verdict	★★★★★



JAM it

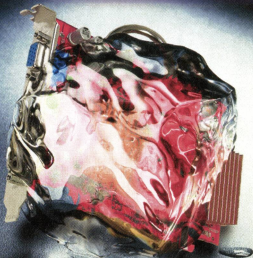
It seems HP's time and money has been sunk into a device that won't rock the world — the DJammer. The combination of an MP3 player with Wi-Fi and Bluetooth, motion sensors and touch sensors will apparently let you scratch music like the pros. What isn't mentioned is whether the motion sensor, designed to change the music by shaking the device, will make *Eye of the Tiger* unlistenable while jogging. www.hpl.hp.com/research/mmsl/projects/djammer.



OH, MR HART!

Proving that no two inventions are ever truly incompatible (at least in Europe), a carpet manufacturer and a chipmaker have joined forces to create Thinking Carpet. Vorwerk Teppichwerke and Infineon Technologies AG are pitching the invention as perfect for controlling alarms and air conditioning by sensing what's going on up top. They also say it'd be great for "guidance systems", although presumably only for the flying version.

The new technology works by embedding sensors into the base of standard rugs. A combination of tough chips and smart networking code makes the Thinking Carpet impervious to damage and normal wear and tear, though with the right software it might demand a vacuum occasionally.



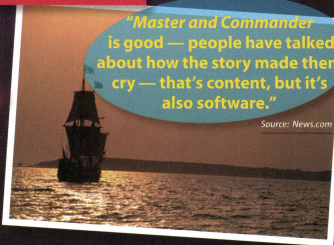
NO LAN SPEED RECORD

After losing out to competitor Nvidia in extreme overclocking benchmarks, ATI decided to get even by going a little mad. At February's ATI-sponsored Ultimate LAN Event in Dallas, Texas, the cream of the overclocking world gathered together in an attempt to crack the world record score in the 3DMark05 benchmark. Despite using specially handcrafted video cards that will never make it to market and many litres of liquid nitrogen, all that came close to cracking was the occasional circuit board chilled to -194°C.

BILL-SPEAK . . .

"Master and Commander is good — people have talked about how the story made them cry — that's content, but it's also software."

Source: News.com



YAHOO!

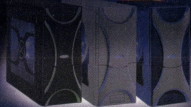
DON'T CREAM YOURSELF

APC is on the receiving end of a lot of PR stunts, such as AMD's "urgent information" pack, celebrating 553 days of 64-bit computing (timed to coincide with Intel's 64-bit Pentium launch), and furry green embroidered Nvidia cushions.

But one company that really understands its target audience is Yahoo. When the "free ice-cream from Yahoo!" email arrived, we thought it was spam. Then we realised that nobody spams about ice-cream.

Turns out Yahoo was celebrating its 10th birthday in Australia by offering anyone who logged on a voucher for a free scoop of ice-cream from Baskin Robbins. Apart from contributing to the national obesity epidemic, Yahoo has figured out exactly what it takes to reach out to geeks — fat and sugar. If Baskin Robbins made a caffeinated pizza ice-cream, Google would be dead in the water.





Always Accompany With You
http://www.super-flower.com.tw

▶ 14CM POWER

Patent
3100446
3100560
Taiwan China Germany

(500W) RRP \$169

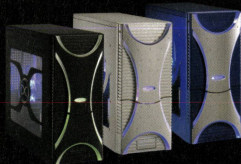


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▶ FAN MASTER

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SF-609

- Fashion looking with outstanding quality.
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▶ X-MASK SF-462

RRP \$169



- Various cooling fan supports in front, rear and side of chassis for highly efficient ventilation.
- Front access USB2.0 / Audio / IEEE1394
- Acrylic side window&colorful light LED Fan.

Resales

NSW:
Marvel Computers Pty Ltd - Castle Hill
www.marvelcomputers.com.au
Eyo Technologies Pty Ltd - Padstow
www.eyo.com.au

Arc Computer - 5 locations
Chatswood, Liverpool, Parramatta
Penrith, Silverwater
www.arc.com.au

Thx Computer Systems-Sydney
www.thx.com.au
Winner It-Newcastle
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The Disc Shop- 9 locations
Cairns, Maroochydore, Rockhampton
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Game Dude-Springwood
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It Warehouse - 6 locations
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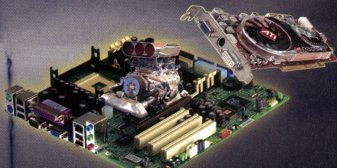
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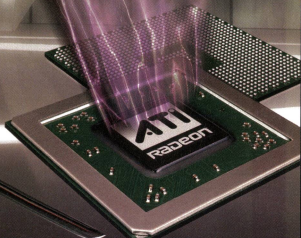
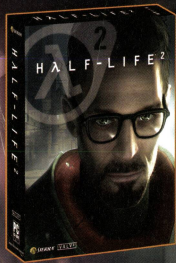


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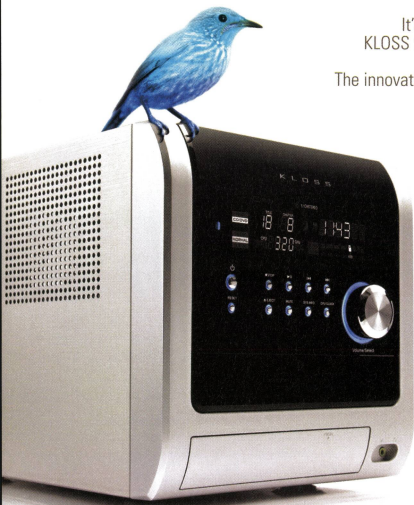
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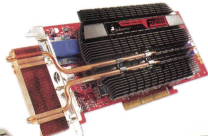
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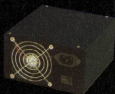
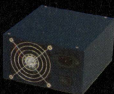


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TO03	\$ 9.90	TO18	\$13.20	TO39	\$13.70	TO491/2/3	\$ 8.90	SO20187	\$ 6.60
TO05	\$18.00	TO19	\$ 7.70	TO321	\$15.10	TO494/5/6	\$ 8.90	SO20189	\$ 6.50
TO07	\$10.80	TO20	\$11.20	TO322/3/4	\$13.50	SO20025	\$11.20	SO20191	\$ 9.90
TO08	\$16.50	TO26	\$11.20	TO422C	\$13.50	SO20089	\$ 9.90	SO20193	\$11.50
TO09	\$16.90	TO27	\$16.50	TO423M	\$13.50	SO20093	\$ 5.60		
TO13	\$ 5.60	TO28	\$11.20	TO424Y	\$13.50	SO20097	\$12.90		
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BC-01	\$39.00	---	BCI-6BK	\$24.00	\$6.40
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BC-03	\$38.00	\$28.00	BCI-6PC/6PM	\$24.00	\$6.40
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HP C3906A	\$105.00	\$ 59.00
HP C3903A	\$130.00	\$ 75.00
HP C3909A	\$249.00	\$115.00
HP C4092A	\$ 99.00	\$ 59.00
HP C4096A	\$155.00	\$ 65.00
HP C4127A	\$155.00	\$ 65.00

Model	Genuine	Compatible
HP C4127X	\$195.00	\$ 80.00
HP C4129X	\$249.00	\$115.00
HP C4182X	\$285.00	\$165.00
HP C7811A	\$ 99.00	\$ 59.00
HP C8061X	\$195.00	\$ 85.00
HP Q1338A	\$219.00	\$ 85.00
HP Q2612A	\$ 99.00	\$ 65.00
HP Q2613A	\$ 99.00	\$ 65.00

Model	Genuine	Refill
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Samsung ML-1710D3	\$ 98.00	\$49.00
Samsung ML-4500D3	\$ 97.00	\$49.00
Samsung ML-5200C6	\$163.00	\$65.00
Samsung ML-6060D6	\$155.00	\$65.00
Samsung SCX-4216D3	\$ 99.00	---
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M3731

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TOSHIBA Toshiba A3 For performance and value.



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from

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nx6120 Series Notebook



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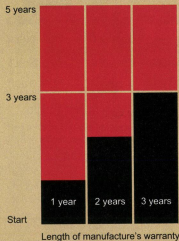
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TECRA	A3	A3	A3
PROCESSOR	Cel-M 360 1.4GHz	Cel-M 370 1.5GHz	P-M 730 1.6GHz
RAM STD	256MB	512MB	512MB
HARD DRIVE	40GB*	40GB*	60GB*
SCREEN	15" XGA TFT	15" XGA TFT	15" XGA TFT (CSV)
OPTICAL DRIVE	DVD/CD-RW	DVD-SuperMulti	DVD-SuperMulti
56K V.92 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	WiFi Antenna	WiFi a/b/g	WiFi a/b/g
WARRANTY	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro
RENT*	\$19.71/wk	\$23.41/wk	\$27.29/wk
PART NUMBER	R0315	R0212	Q9055
PRICE	\$1,759	\$2,089	\$2,639

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TECRA	A4	A4
MOBILE PENTIUM M	730 1.6GHz	740 1.7GHz
RAM STD	512MB	512MB
HARD DRIVE	60GB*	60GB*
SCREEN	15.4" WXGA TFT	15.4" WSXGA+ TFT
VIDEO RAM	up to 128MB Shared	64MB Dedicated
OPTICAL DRIVE	DVD SuperMulti	DVD SuperMulti
WIRELESS LAN	WiFi a/b/g	WiFi a/b/g & BT
WARRANTY	1 year	1 year
OP SYSTEM	XP Pro	XP Pro
RENT*	\$30.45/wk	\$33.84/wk
PART NUMBER	R2864	R3631
PRICE	\$2,969	\$3,299

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TECRA M3

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MODEL	TECRA M3	TECRA M3	TECRA M3	TECRA M3
MOBILE PENTIUM M	730 1.6GHz	740 1.7GHz	750 1.8GHz	760 2GHz
RAM STD (DDR II)	512MB	512MB	512MB	2 x 512MB
HARD DRIVE	40GB#	60GB#	60GB#	80GB#
SCREEN	14" XGA TFT	14" XGA TFT	14" XGA TFT	14" SXGA+ TFT
VIDEO RAM	64MB	64MB	128MB	128MB
OPTICAL DRIVE	DVD/CD-RW	DVD SuperMulti	DVD SuperMulti	DVD SuperMulti
WIRELESS LAN	Upgradable	WiFi a/b/g	WiFi a/b/g	WiFi a/b/g
WARRANTY	1 year	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro	XP Pro
RENT*	\$29.32/wk	\$33.84/wk	\$35.72/wk	\$42.84/wk
PART NUMBER	R3721	R3722	R3723	R3724
PRICE	\$2,859	\$3,299	\$3,599	\$4,345

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MODEL	TECRA S2	TECRA S2	TECRA S2
MOBILE PENTIUM M	740 1.7GHz	750 1.8GHz	760 2GHz
RAM STD	512MB	512MB	512MB
HARD DRIVE	60GB#	80GB#	100GB#
SCREEN	15" XGA TFT	15" SXGA+ TFT	15" UXGA TFT
VIDEO RAM	64MB	128MB	128MB
OPTICAL DRIVE	DVD SuperMulti	DVD SuperMulti	DVD SuperMulti
WIRELESS LAN	WiFi a/b/g	WiFi a/b/g, BT	WiFi a/b/g, BT
WARRANTY	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro
RENT*	\$30.78/wk	\$37.11/wk	\$44.45/wk
PART NUMBER	R3726	R3727	R3728
PRICE	\$2,999	\$3,739	\$4,699

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M300

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PORTÉGÉ	R100	M200 TABLET	M100	M300
MOBILE PENTIUM M	1.1GHz	725 1.6GHz	1.4GHz	733 ULV 1.1GHz
RAM STD	2 x 256MB	512MB	512MB	2 x 256MB
HARD DRIVE	40GB*	80GB*	80GB*	60GB*
SCREEN	12.1" XGA	12.1" SXGA+	12.1" XGA	12.1" XGA
56K V.90 & 10/100 LAN	Yes	Yes	Yes	Yes
WIRELESS LAN	WiFi b/g	WiFi b/g	WiFi b/g & BT	WiFi a/g & BT
OPTICAL DRIVE	No	No	DVD/CD-RW	DVD SuperMulti
WEIGHT	From 1.1kg	2.1kg	From 1.8kg	From 1.6kg
OP SYSTEM	XP Pro	XP Tablet	XP Pro	XP Pro
RENT*	\$38.40/wk	\$42.34/wk	\$37.66/wk	\$39.04/wk
PART NUMBER	P3052	Q9507	R1307	R6441
PRICE	\$3,895	\$4,295	\$3,795	\$3,960

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TOSHIBA

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Projectors

PROJECTORS

TDP-S20 & TDP-SW20



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TDP-S20

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P0226

\$1,699

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R4044

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TDP-T90 & TDP-TW90



Image for illustration purposes only

TDP-T90

Toshiba's TDP T90 Projector is versatile, with all the features and functionality you would expect from a high performance projector. The TDP T90 has XGA resolution, 2200 ANSI Lumen and 2000:1 contrast ratio. The TDP T90 also comes with extensive range terminal inputs, 2 x RGB computer inputs, 1 x monitor out, video -In, S-Video-in, Audio-in and out.

Rent* \$32.81/wk

P0228

\$3,199

TDP-TW90

The TDP-TW90 features all the benefits of the T90 plus the addition of built in 802.11b wireless connectivity. The bundled Toshiba software utility allows you to easily connect to the projector from your wireless enabled notebook. You can easily switch between presenters with TDP TW90 allowing access to 4 PCs at once. The the TDP TW90 can work in ad hoc or network mode.

Rent* \$37.70/wk

R4045

\$3,799



ADVANTAGES AND FEATURES OF THE TOSHIBA WIRELESS[^] PROJECTORS

- No cables are required to connect the projector to a PC
- Wireless transmission is possible up to a distance of 50 metre in any direction
- Access to projector from multiple PC's - sequential presentations are facilitated through the change of screen settings without the need to switch the RGB cable to another PC
- Send data from one wireless PC to multiple projectors - no cumbersome and expensive wiring needed, making the set up in large conference rooms an easy task. You can have 1 x PC transmitting to up to 4 wireless Toshiba projectors at once
- Quick and easy setup

TOSHIBA EXTENDED

WARRANTY

Extends 2 year original warranty to 3 years.

M5104

\$380

[^] TDP-SW20 and TDP-TW90 models only

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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ACER NOTEBOOKS

ACCESSORIES

TRAVELSURE
CARRY CASEM0838 **\$49**EXTERNAL USB 1.44MB
FLOPPY DISK DRIVEL1793 **\$179**ADDITIONAL BATTERY
for TravelMate 2300 / 4000R1647 **\$300**AC ADAPTOR + POWER CORD
for 2000 and 2500 SeriesP3285 **\$137**AC ADAPTOR + POWER CORD
for 4000 SeriesQ3818 **\$137**TARGUS USB 2.0
MOBILE PORT STATIONN0426 **\$249**

*RENTSMART

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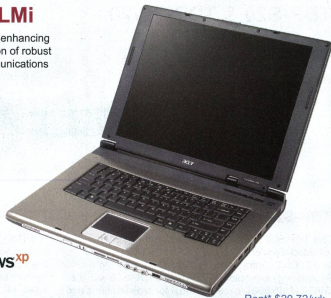
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TRAVELMATE 2308WLMi

The TravelMate 2300 is the perfect partner for enhancing your efficiency and success with its combination of robust processing power, graphics capabilities, communications and dependable design.

- Intel Pentium M 715 1.5GHz
- 256MB RAM
- 40GB Hard Disk*
- DVD±RW Drive
- Modem / LAN / WiFi
- 3 x USB 2.0 ports
- Weighs 2.9kg
- Li Ion battery for up to 5 hours of use
- 15.4" wide screen
- Windows XP Professional



Rent* \$20.72/wk

R0596

\$1,849

TRAVELMATE 4002WLMi

The professionally balanced TravelMate 4000 is well designed to optimise your productivity and amplify success, combining solid processing and graphics capabilities, with wide ranging functionality.

- Intel Pentium M 725 1.6GHz
- 512MB RAM
- 60GB Hard Disk*
- DVD±RW Drive
- Modem / LAN / WiFi
- 3 x USB 2.0 ports
- 1 x Firewire / 1 x S-Video Out
- Weighs 2.95kg
- Li Ion battery for up to 5 hours of use
- 15.4" wide screen
- Windows XP Professional



Rent* \$25.32/wk

N9909

\$2,449ACER'S 2 HOUR COMMITMENT WARRANTY EXPRESS SERVICE
GUARANTEES THAT YOU'LL NEVER BE KEPT WAITING AGAIN

1 year return to base with 2 hour Express Service. 2 hour repair turnaround available in Brisbane, Sydney, Melbourne, Perth, Canberra, Adelaide, Hobart, Auckland, Christchurch & Wellington.

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition. Up to 5GB used for recovery partition may be unavailable. Recovery discs not included with some brands of notebooks and desktops.

SONY

harristechnology



Notebooks

VAIO NOTEBOOKS

FAST & SLIM 15.4" WIDE SCREEN

VGNF515GP

- Pentium M 730 1.6GHz
- 15.4" WXGA with Clear Bright
- 512MB RAM
- 40GB HDD*
- DVD/CD-RW Combo Drive
- Wireless LAN 802.11b/g
- Windows XP Professional



Rent* \$25.84/wk

Q9516 **\$2,499**

VGNF518GP

- Pentium M 740 1.7GHz
- 15.4" WXGA with Clear Bright
- 512MB RAM
- 80GB HDD*
- DVD±RW Dual-Layer Drive
- Wireless LAN 802.11b/g
- Windows XP Professional



Rent* \$30.76/wk

Q9515 **\$2,999**

COMPACT WITHOUT COMPROMISE

VGNS38GP

- Pentium M 740 1.7GHz
- 13.3" WXGA with Clear Bright
- 512MB RAM
- 60GB HDD*
- DVD±RW Drive
- Wireless LAN 802.11b/g
- Integrated bluetooth
- Windows XP Professional



Rent* \$39.43/wk

Q9514 **\$3,999**

VGNT27GSP

- Pentium M 735 1.2GHz (ULV)
- 10.6" WXGA with Clear Bright
- 512MB RAM
- 60GB HDD*
- DVD±RW Drive
- Wireless LAN 802.11b/g
- Integrated bluetooth
- Windows XP Professional



Rent* \$39.43/wk

Q9443 **\$3,999**



**BONUS
BUNDLED
VAIO BAG**



Rent* \$20.16/wk

Q3573 **\$1,799**



VGNB99GP

- Pentium M 725 1.6GHz
- 14.1" SXGA Display
- 512MB RAM
- 40GB HDD*
- DVD±RW Dual-Layer Drive
- Wireless LAN 802.11b/g
- Weighs 2.3kg
- Windows XP Professional



Rent* \$25.84/wk

R0602 **\$2,499**

THE ULTIMATE MULTIMEDIA POWER PACKAGE



THE POWER OF A DESKTOP, THE PORTABILITY OF A NOTEBOOK, THE STYLE OF SONY.

Introducing the full featured notebook with Centrino mobility and large 17" display, designed to out perform in the office and to entertain at home.

VGNA39GP

- Pentium M 770 2.1GHz
- 17" WUXGA with Clear Bright and Dual Lamps
- 512MB RAM
- 100GB HDD*
- 128MB Video RAM
- DVD±RW Dual Layer Drive
- Wireless LAN 802.11 b/g
- Windows XP Professional
- Includes stereo speakers & port replicator

Rent* \$46.13/wk

R3049 **\$4,999**

*RENTSMART

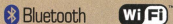
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HP NOTEBOOKS & POCKET PC's

HP iPAQ H6365
POCKET PC & GSM/GPRS
CONVERGED DEVICE

- Processor: TI OMAP 1510
- Up to 55 MB user available memory (includes 20 MB of iPAQ File Store)
- Display: 240 x 320 TFT touch screen
- Audio: built in w/ 3.5mm jack
- Camera: VGA 640 x 480
- Expansion: SD/MMCard Slot with SDIO
- Communication: integrated GSM/GPRS, 802.11b Wi-Fi, bluetooth
- Dimensions: 119 x 75 x 18mm
- Weight: 190g
- Microsoft Windows Mobile 2003 phone edition
- Warranty: 1 year manufacturer's parts and labour

Rent* \$11.19/wk

Q2078

\$999

*TERMS & CONDITIONS

Offer available from 01/04/05 to 30/04/05. Sure PC to be redeemed from HP. Not available in conjunction with any other offer. Further details available at hpstore.ht.com.au

Transfer of backup data via internet service provider at customer's expense.

*RENTSMART

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HP COMPAQ nx6120 NOTEBOOKS

Packed to perform, priced to please.

The HP Compaq nx6120 Business Notebook is packed with advanced technology features offering solid performance at a surprisingly affordable price. What's more, most models come with wireless connectivity so that you can get the job done effortlessly, wherever your work takes you.

†Purchase any nx6120 series notebook and receive a Bonus HP SURE PC Backup and Recovery Service. You'll have peace of mind knowing your important data will be safe and secure in one of HP's offsite servers. You'll receive 1GB of free storage for 3 years*.



MODEL	nx6120	nx6120	nx6120	nx6120	nx6120
PROCESSOR	C-M 360	C-M 360	P-M 730	P-M 730	P-M 740
CLOCK SPEED	1.4GHz	1.4GHz	1.6GHz	1.6GHz	1.7GHz
RAM	256MB	256MB	512MB	512MB	512MB
HARD DRIVE	40GB#	40GB#	40GB#	60GB#	80GB#
SCREEN	15" XGA	15" XGA	15" XGA	15" XGA	15" SXGA+
OPTICAL DRIVE	Combo	DVD±RW	DVD±RW	DVD±RW	DVD±RW
WIRELESS LAN		802.11b/g	802.11b/g	802.11b/g + BT	802.11b/g + BT
WARRANTY	1 year	1 year	1 year	1 year	1 year
RENT*	\$15.63/wk	\$18.99/wk	\$22.36/wk	\$24.60/wk	\$25.80/wk
PART NUMBER	R7182	R7183	R7184	R7185	R7186
PRICE	\$1,395	\$1,695	\$1,995	\$2,195	\$2,495

HP POCKET PC's

The slim and sleek HP iPAQ series Pocket PC's make it easy to be productive at work, at home, or on the go.

Whether you are at the beach or just stepping out of the office, you can always enjoy total control without being tied down. With its broad range of features, popular applications, expansion capabilities and multimedia solutions, you can have all the essentials you need at the affordable value you want. All units run Microsoft Windows Mobile 2003 and come with 12 months manufacturer's warranty. Includes: AC Adaptor, USB Sync Cable, Stylus, Companion CD and Documentation Kit



Image for illustration purposes only



iPAQ	rz1710	hx2100	rx3417	rx3715	hx2750	hx4700
PROCESSOR	203MHz	312MHz	300MHz	300MHz	624MHz	624MHz
MAIN MEMORY	25MB RAM	64MB RAM	92MB RAM	152MB RAM	192MB RAM	144MB RAM
DISPLAY	<----- 3.5" TFT touch screen 240 x 320 ----->					4" 480x640
WEIGHT	120g	164g	147g	158g	164g	187g
EXPANSION	SDIO	CF / SDIO	SDIO	SDIO	CF / SDIO	CF / SDIO
COMMUNICATIONS		BT	BT & Wi-Fi	BT & Wi-Fi	BT & Wi-Fi	BT & Wi-Fi
RENT*		\$6.71/wk	\$7.38/wk	\$8.50/wk	\$9.85/wk	\$10.86/wk
PART NUMBER	P5971	Q2079	P5974	P5973	Q2213	P5972
PRICE	\$399	\$599	\$659	\$759	\$879	\$969

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition. Up to 5GB used for recovery partition may be unavailable. Recovery discs not included with some brands of notebooks and desktops.



invent

harristechology



Desktops

HP COMPAQ DX6120 SERIES DESKTOPS

SLIM TOWER DESKTOPS

The HP Compaq Business Desktop dx6120 series combines latest proven technology with the best balance of price and performance. They offer outstanding customer value and ease of ownership at the lowest initial purchase price, delivering the best value to business computing customers.

The HP Compaq dx6120 is well suited for small and medium size businesses, government customers and enterprise businesses. Offered in both microtower and slim tower form factors.



MICRO TOWER DESKTOPS



- 2x256MB DDR2 Synch DRAM PC3200 (400-MHz)
- 80GB 7200 rpm Ultra SATA Hard Drive*
- Integrated Intel graphics media accelerator 900 graphics
- Integrated Broadcom NetXtreme gigabit ethernet
- 48X CD Drive
- Keyboard (USB), optical scroll mouse (USB)
- SoundMax Digital AC97 integrated audio with internal speaker
- 8 USB 2.0 ports
- Colour: Carbonite/Silver
- Windows XP Professional

DX6120 Celeron D330 2.6GHZ

Rent* \$10.63/wk

R6610

\$949

DX6120 P4 520 2.8GHZ

Rent* \$14.00/wk

R6611

\$1,249

DX6120	ST	ST	ST	ST	ST	ST
PROCESSOR	Cel D330 2.6GHz	Cel D330 2.6GHz	P4 520 2.8GHz	P4 520 2.8GHz	P4 540 3.2GHz	P4 540 3.2GHz
RAM	2x256MB	2x256MB	2x256MB	2x256MB	2x256MB	2x256MB
HARD DRIVE*	80GB 7200 rpm Ultra SATA Hard Drive*					
OPTICAL DRIVE	Combo	Combo	Combo	Combo	Combo	Combo
OP SYSTEM	XP Home	XP Pro	XP Home	XP Pro	XP Pro	XP Pro
SOFTWARE	Norton Anti Virus + Altiris Local Recovery					
RENT*	\$9.51/wk	\$10.63/wk	\$12.87/wk	\$14.00/wk	\$15.68/wk	\$16.80/wk
PART NUMBER	R6613	R6614	R6615	R6616	R6618	R6621
PRICE	\$849	\$949	\$1,149	\$1,249	\$1,399	\$1,499

*RENTSMART

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FOR BUSINESSES ON THE MOVE

ACCESSORIES

TREO 650 CRADLE KIT

R4266 **\$80**

TREO 650 FORM FIT LEATHER CASE

R4251 **\$26**

TREO 650 BATTERY

R4263 **\$70**

TREO 600/650 SIDE FIT LEATHER CASE

R4258 **\$26**

TREO 650 STYLUS PEN PACK

R4253 **\$22**

TUNGSTEN T5 TRAVEL CHARGER KIT

Q3656 **\$40**

TUNGSTEN T5 CRADLE KIT

Q3372 **\$59**

TUNGSTEN T5 LEATHER CASE

Q3375 **\$35**

TUNGSTEN T5 HARD CASE

Q3373 **\$59**

*RENTSMART

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palmOne TREO 650

GSM/GPRS QUAD-BAND SMARTPHONE

The Treo 650 smartphone from palmOne makes it easier than ever to stay connected. It simplifies your life by combining a compact mobile phone with email, an organiser, messaging and web access. Not to mention an MP3 player, a digital camera that captures video and a vibrant colour screen that brings everything to life.

- Full featured mobile phone and Palm Powered organiser
- Intel Xscale 312MHz processor
- 22MB user accessible memory; SDIO/MMC
- Bright colour backlit 320 x 320 display
- Input device: stylus, 5 way navigation button, QWERTY keyboard
- Battery: Lithium ion
- Communication: GSM / GPRS / Quad Band, infrared, USB cable
- Dimensions: 113 x 59 x 23mm
- Built in Bluetooth wireless technology
- Built in VGA camera
- Palm OS 5.4
- Weight: 178g
- Software: Phone, Contacts, Calendar, VersaMail, Messaging, Media, Camera, Camcorder, Web Browser, RealPlayer, Tasks, Memos, Calculator, World Clock, HotSync Manager, palmOne Installation Software, Microsoft Outlook Synchronisation Software (Windows only)



Treo 650



Rent* \$11.19/wk

R3503

\$999

palmOne TUNGSTEN T5
THE HANDHELD THAT'S ALSO A
USB DRIVE & MP3 PLAYER

Quick facts:

- 256MB¹ of storage
- Transfer files and folders back and forth to your desktop
- Use like a flash drive with another computer²
- Stunning 320 x 480 display, landscape or portrait mode
- Create and edit Word and Excel docs, view PowerPoint files
- View photos, videos³ and play MP3s
- Built in Bluetooth wireless technology
- Powerful Intel 416MHz XScale processor
- Palm OS 5.4

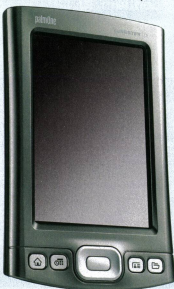
¹ 215MB actual storage capacity (160MB internal flash drive, 55MB program memory for applications & data).

² Host computer must support standard USB removable drive.

³ Some files may require conversion.



TUNGSTEN T5



Rent* \$6.49/wk

Q3013

\$529

R3609 INCLUDES SD WIFI CARD

\$579

GET MOBILE... GET TARGUS

PORT REPLICATORS

MOBILE PORT STATION



Expand your notebook's capabilities! Add audio, Ethernet, serial, parallel and up to five USB devices such as mice, joysticks, keyboards and more.

N0426 **\$209**

USB 2.0 MOBILE PORT REPLICATOR



Ideal for home, office or on the road, this portable station provides support for both legacy (serial, parallel and PS/2) and USB 2.0 devices.

P2695 **\$109**

USB PORT REPLICATOR WITH VIDEO



- One cable solution via the USB port replicator with integrated video over USB
- Provides 4 USB Ports

R1718 **\$299**

TABLET PC & NOTEBOOK STAND



Image for illustration purposes only.

M9827 **\$34**

OFFERS NOT TO BE MISSED

DESKTOP SOLUTION



Includes a Tablet PC & Notebook stand, full size optical mouse & corporate standard keyboard.

R7416 **\$79**

NOTEBOOK ESSENTIALS



Includes a CityLite Sprint Navy case, a wired mini optical mouse & a USB 2.0 ultra mini 4 port hub.

R7599 **\$99**

LIFESTYLE PACK



Includes an Xtreme Backpack, a wired mini optical mouse, a USB FM egg radio & a USB 1.1 micro swivel 4 port hub.

R7601 **\$109**

NOTEBOOK LCD/MONITOR STAND



K1787 **\$32**

NOTEBOOK LAPDESK



J2022 **\$59**

CASES

BLACKTOP DELUXE NOTEBOOK CASE



Features a signature rubber CompuTread around the outside of the case that serves as both a stylish design element and shock absorption. Additional compartment for storage of files or magazines and a front file section with pockets for your CDs, pens, a mobile phone, and PDA.

E7009 **\$79**

LEATHER ATTACHÉ CASE



This meticulously hand crafted leather case combines elegance and functionality and is designed for organisational efficiency, with compartments for a notebook computer, files and additional software this is the perfect solution for the executive traveller.

P6998 **\$139**

CITYGEAR PHOENIX ROLLING NOTEBOOK CASE



This rolling case allows for you to comfortably store your large size notebook as well as having an overnight luggage section with room for a change of clothes. Perfect for short business trips on the road.

R7245 **\$129**

UNIVERSAL MONITOR STAND



NB: Monitor & Notebook not included.

H0569 **\$69**

PLEASE NOTE:

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A LEADER IN WIRELESS NETWORKING

10/100 16 PORT SWITCH SD216



- Linksys 16 port 10/100 switch can significantly increase your network traffic's speed.
- Integrated 10Mbps ethernet and 100Mbps fast ethernet devices.
- All 16 ports are auto speed negotiating, and have automatic MDI/MDI-X crossover detection. Ultra-compact case design to fit into your workgroup environment.

L5970

\$129

10/100 24 PORT SWITCH + 2 GIGABIT PORTS SRW224



- 24 autosensing 10/100 full duplex, auto MDI/MDI-X ports
- Two Gigabit 10/100/1000BaseTX MDI/MDI-X ports and a mini GBIC expansion port
- WebView remote monitoring and configuration via web browser
- 64 VLANs, 7 port trunking groups, console port, 802.1 QoS support

R1140

\$449

PLEASE NOTE:

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WIRELESS G ADSL GATEWAY - WAG54G



- ADSL modem with 4 x 10/100 switch ports
- Wireless 802.11G 54MB access point, supports both 11MB & 54MB clients
- Wireless security includes WEP, WPA & 802.1x
- Powerful stateful packet firewall with denial of service attack prevention
- VPN server, 5 VPN tunnels - also supports VPN pass-through
- 3 year exchange warranty

M5307

\$209

WIRELESS - G RANGE EXTENDER - WRE54G



- The easiest way to expand your wireless network's coverage
- Save on wiring costs - no wired connection to your network necessary
- Extend your wireless signal into hard-to-reach areas
- Compatible with both Wireless-G and Wireless-B networking clients

P9344

\$129

WIRELESS-G BROADBAND ROUTER - WRT54G



- All-in-one wireless internet Router, allows you to share your broadband connection wirelessly, 802.11G wireless, 4 port 10/100 ethernet switch.
- Wireless data rates up to 54Mbps
- Shares a single internet connection and other resources with Ethernet wired and Wireless-G clients
- Advanced wireless security with 128 bit WEP encryption, MAC or IP address filtering
- 3 year limited warranty

H9739

\$129

NETWORK STORAGE LINK FOR USB 2.0 DISK DRIVES - NSLU2



- Connects USB 1.1 or 2.0 disk drives and flash disks directly to your network
- Share music, video, or data files with managed access by user name or group
- Integrated file server - access your files from the internet
- Built-in disk utilities - format, backup and scandisk

P8510

\$159

802.11G 54MBPS WIRELESS-G USB ADAPTER - WUSB54G



- Connects your desktop or notebook to a wireless network at up to 54Mbps when used with a USB 2.0 port
- Easy, no-tools setup on any desktop or notebook computer with USB support
- Also compatible with Wireless-B networks (at 11Mbps)
- Wireless communications are protected WPA encryption

M6496

\$79

WIRELESS-G INTERNET VIDEO CAMERA - WVC54G



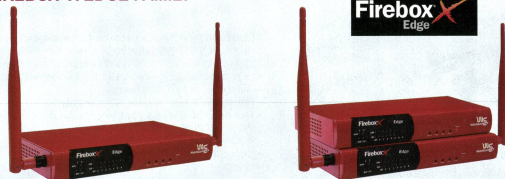
- Sends a high-quality live audio/video stream to your network wirelessly over 802.11g - viewable from anywhere
- Built-in stand-alone web server, no PC necessary
- Security mode automatically sends email alerts with video clips upon motion detection
- Supports up to four simultaneous remote users

R1359

\$399

SECURITY, FIREWALL AND VPN APPLIANCES

FIREBOX® X EDGE FAMILY



Firebox® X Edge, model-upgradeable VPN endpoints and SOHO firewall security appliances, deliver commercial-grade solutions that integrate perfectly with Firebox X to provide full, centralised management, logging, and historical reporting for securing telecommuter and remote offices. In addition, their intuitive user interfaces help small businesses with limited security expertise secure networks effortlessly.

FIREBOX EDGE	Firebox® X5	Firebox® X5w	Firebox® X15	Firebox® X15w	Firebox® X50	Firebox® X50w
	WG40005	WG40006	WG40015	WG40070	WG40050	WG40080
FIREWALL THROUGHPUT (Mbps)	80	80	95	95	100+	100+
VPN THROUGHPUT (Mbps)	35	35	35	35	35	35
CONCURRENT SESSIONS	6,000	6,000	8,000	8,000	10,000	10,000
BRANCH OFFICE VPN TUNNELS	2	2	15	15	25	25
MOBILE USER VPN TUNNELS	11	11	25	25	50	50
USER LIMIT	12	12	30	30	50+	50+
RENT*	\$8.28/wk	\$9.62/wk	\$10.07/wk	\$12.31/wk	\$17.59/wk	\$19.27/wk
PART NUMBER	P9512	R1522	P9522	R1523	P9532	R1524
PRICE	\$739	\$859	\$899	\$1,099	\$1,570	\$1,720

FIREBOX® X GATEWAY ANTI VIRUS FOR E-MAIL

WatchGuard® Gateway AntiVirus for E-mail service delivers robust e-mail protection integrated into your Firebox® X. This additional layer of antivirus security delivers signature-based protection against viruses, worms, trojans and blended threats, before they enter your network. The affordable yearly subscription is priced by model, regardless of how many users you need to protect.

FIREBOX X500 1-YEAR GATEWAY ANTIVIRUS FOR EMAIL SUBSCRIPTION

R1426 **\$465**

FIREBOX X1000 1-YEAR GATEWAY ANTIVIRUS FOR EMAIL SUBSCRIPTION

R1438 **\$1,230**

FIREBOX X700 1-YEAR GATEWAY ANTIVIRUS FOR EMAIL SUBSCRIPTION

R1427 **\$755**

FIREBOX X2500 1-YEAR GATEWAY ANTIVIRUS FOR EMAIL SUBSCRIPTION

R1440 **\$2,989**



Firebox® X500

WG40500

Small businesses requiring an affordable, integrated security appliance with simple operation. Perfect for 20 - 100 users.

Rent* \$36.76/wk

M5787

\$2,999

Firebox® X700

WG40700

Small businesses requiring an affordable, integrated security appliance that grows with their needs. Designed for 50 - 200 users.

Rent* \$36.31/wk

M5788

\$3,659

Firebox® X1000

WG41000

Medium businesses requiring multi-layered security solutions with centralised management. Ideal for 200 - 500 users.

Rent* \$46.35/wk

M5789

\$4,899

Firebox® X2500

WG42500

Medium or distributed enterprises requiring the utmost protection and remote connectivity. For organisations with more than 500 users.

Rent* \$67.28/wk

M5791

\$7,559

*RENTSMART

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WIRELESS / BROADBAND SOLUTIONS

BASE HOME NETWORK INSTALLATION PACKAGE

Initial
Installation
of Network



- Base home network installation package for initial installation of network
- Connect up to 2 PCs (desktop and/or laptop)
- Connect 1 D-Link router
- Install 2 D-Link network adapters
- Connect D-Link router to existing broadband connection
- Share Internet connection between 2 computers
- Perform standard testing
- Coverage within 80kms of metro areas

DIS-101

R1400

\$169

DIS-102

R1401

\$49

BLUETOOTH USB ADAPTER

**NEW!**

- Connect with Bluetooth Enabled Devices
- Works with PC & Mac
- Seamless Wireless Personal Area Network (PAN) Connectivity

DBT-122

R7527

\$79

*RENTSMART

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HIGH-SPEED 2.4GHZ 802.11G 54MBPS^A POCKET ROUTER/AP™

**NEW!**Up to
54 Mbps

DWL-G730AP

Portable Wireless Connectivity

The DWL-G730AP is a portable and convenient wireless solution for the traveling business person delivering 802.11g wireless connectivity with a maximum wireless signal rate of up to 54Mbps^A. Use it in conference rooms, hotel rooms, or even at hotspots.

- Portable 802.11g^A Wireless Connectivity
- Can be used as an Access Point, Router, or Wireless Client
- Includes convenient travel case
- Supports power over USB

R7529

\$179

WIRELESS ACCESS POINT

Up to
15x
Faster

DWL-7100AP

- Up to 108Mbps
- Enhanced security features
- 802.11g, 802.11b, 802.11a Compatible
- 4 operational modes

WIRELESS PCI ADAPTER

**NEW!**

DWL-AG530

- Tri-mode, dualband adapter
- Wirelessly connect to any one of three available wireless networks 802.11b, 802.11g and 802.11a
- Operate in two discrete, non-interfering frequency bands: 2.4GHz and 5GHz

N6835

\$419

P3059

\$155

802.11G 54MBPS^A WIRELESS INTERNET CAMERA SURVEILLANCE

**NEW!**

DCS-3220G

- Enhanced video & 2 way audio surveillance
- First-to-market 802.11g^A wireless internet camera
- Monitor your home or office over the internet
- 2-Way audio and built-in motion detection with e-mail notification
- 4x digital zoom for close-up viewing

Rent* \$10.41/wk

R5965

\$929

ADSL USB/ETHERNET COMBO MODEM/ROUTER



DSL-502T

- IP router/broadband internet gateway & hardware firewall
- Built-in ADSL modem, USB and fast ethernet ports.
- VPN support: PPTP/L2TP/IPSec pass-through
- Network address/ port translation (NAPT)
- DoS (UDP/TCP), detection of known attacks
- Stateful packet inspection (SPI)
- Admin / configuration through web browser
- Installation wizard
- Telstra approved

R6714

\$129

^AMaximum wireless signal rate of up to 54Mbps, based on IEEE Standard 802.11g specifications.

Actual data throughput will vary. Network conditions and environmental factors lower actual data throughput rate.

CORPORATE NETWORKING SOLUTIONS

DFL-700 NETWORK SECURITY APPLIANCE BUNDLE

NetDefend



BUNDLE INCLUDES
NETDEFEND
DS-601
(Single Licence)

The DFL-700 is a powerful security solution

- Provides integrated Network Address Translation (NAT)
- Hardware based SPI Firewall
- Advanced content filtering features, IDS protection, bandwidth management, as well as Virtual Private Network (VPN) support.
- 3 year warranty

Rent* \$10.07/wk

Q9608 **\$899**

DFL-1100 INTEGRATED VPN FIREWALL BUNDLE

NetDefend



BUNDLE INCLUDES
NETDEFEND
DS-605
(5 Licences)

D-Link DFL-1100 Network Security Firewall for Enterprise Networks

- Advanced Firewall Security
- Strong AES Encryption for Secure VPN
- Manage up to 1000 VPN Tunnels
- 3 year warranty

Rent* \$33.73/wk

Q9607 **\$3,399**

DES-1316 16 PORT POE 10/100Mbps SMART SWITCH



NEW!

The D-Link DES-1316 Smart Switch provides 16 x 10/100Mbps Ethernet ports, of which 8 ports support PoE for device connection, and the other 8 ports without PoE for workstation/server attachment. Complying with industry standard 802.3af Power over Ethernet (PoE), the PoE ports provide power over the normally unused pairs of the Ethernet cables, which makes it very valuable for deployment of VoIP phones, remote surveillance cameras and wireless access points. Designed for Business and hot spots and suitable for installation at offices, factories, hospitals and schools.

Rent* \$8.95/wk

R7521 **\$799**

DES-1226G 24 PORT 10/100Mbps WEBSMART SWITCH WITH 2 COMBO COPPER GIGABIT/ MINI-GBIC PORTS



Smart

N9093

\$535

DWL-P50 POWER OVER ETHERNET (POE) ADAPTER



NEW!

The DWL-P50 is useful for installation at a factory or Wi-Fi hot spot. This compact adapter allows you to install your surveillance cameras and wireless LAN devices on a building rooftop, on or near a ceiling for maximum coverage. Your cameras or wireless access points can be placed up to 100 meters away from a power source.

R7524

\$74

DS-601/DS-605 - VPN REMOTE ACCESS SOFTWARE

NetDefend VPN Client software assists organisations to build end-to-end secured connectivity for mobile employees and teleworkers. The NetDefend VPN Client uses standard IPSec implementation with advanced 3DES/AES encryption and has comprehensive Windows support. Provides cost-effective, secure access for mobile users from any location, using any Internet connection, over any IP network environment.

DS-601 (Single user licence)

R7470 **\$64**

DS-605 (5 user licence)

R0483 **\$165**

GIGABIT INTERFACE CONVERTER

DEM-311GT

Mini-GBIC to 1000BaseSX Multi-mode Fibre, up to 550m. 3 year product warranty.

H9627 **\$409**

DEM-312GT2

Mini-GBIC to 1000BaseLX Multi-mode Fibre, up to 2km. 3 year product warranty.

R1525 **\$449**

DEM-310GT

Mini-GBIC to 1000BaseLX Single-mode Fibre, up to 10km. 3 year product warranty.

Rent* \$7.61/wk

H9626 **\$679**

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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NETGEAR RANGEMAX™ - WIRELESS EVERYWHERE

108Mbps SUPER WIRELESS
ADSL ROUTER

DGR834GT

- All in One Gateway combines ADSL2+ modem, router, firewall, Super G access point and 4 port switch
- 108Mbps Wireless Speed with Super G Technology (when used with Netgear 108Mbps adapters)
- Easy to set-up, Smart Wizard gets you up and running in less than 5 clicks
- Over 10 security & privacy features including a double firewall (NAT + SPI)

Q5517

\$249

108Mbps CABLE/DSL
WIRELESS ROUTER

WG7624

- 108Mbps wireless speed (when used with Netgear 108Mbps Adapters)
- Easy to set-up, Smart Wizard gets you up and running in less than 5 clicks
- Over 10 security & privacy features including a double firewall (NAT + SPI) and WPA
- One 10/100Mbps Internet port and 4 port Ethernet 10/100Mbps Switch
- Multi - VPN pass-through support (2, IPSec, and multiple L2TP & PPTP)
- Full range of 108Mbps Adapters available.

L6032

\$129

Check out www.netgear.com.au/warranty for full warranty options

PLEASE NOTE:

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RANGEMAX™ WIRELESS ROUTER



WPN824

Netgear's RangeMax™ Wireless Router eliminates dead spots and delivers up to 10 times more wireless coverage and speed than standard 802.11g. Customers will enjoy high speed Internet access everywhere in their homes, not just when they are situated close to their wireless router. RangeMax uses 7 internal smart antennas to survey the home environment for walls, furniture, and interference and automatically adjust to compensate for these performance blockers. RangeMax Smart MIMO (Multi-In, Multi-Out) technology is 100% compatible with 802.11b, 802.11g, and Super G® devices, and provides legacy 802.11b/g clients with up to 50% improvement in range and speed.

R5401

\$249

RANGEMAX™ ADAPTERS

Netgear's RangeMax Adapters, when used with the WPN824 Wireless Router, delivers up to 1000% the coverage and speed of 802.11g. New antenna technology has increased range beyond what was ever possible with previous generation Wi-Fi adapters. Keep your network private with WPA (Wi-Fi Protected Access). Setup is quick and easy with the Smart Wizard install assistant.

WPN511 RANGEMAX™
WIRELESS PC CARD

R4068

\$149

WPN111 RANGEMAX™
WIRELESS USB 2.0 ADAPTER

Q3512

\$169

WPN311 RANGEMAX™
WIRELESS PCI ADAPTER

R4066

\$149

CABLE/DSL PROSAFE
WIRELESS ROUTER

FWG114P

- Integrated 54Mbps 802.11g wireless access point
- Advanced security with Stateful Packet Inspection (SPI) firewall, IPSec, PPTP, L2TP VPN pass-through support, WPA and WEP security for wireless
- 2 x VPN tunnels
- DB-9 port included to support an ISDN or analog modem connection
- Built-in USB print server

L2431

\$249

PROSAFE VPN FIREWALL 50 ROUTER



FVS338

- Initiates up to 50 Hardware-Based VPN tunnels
- Advanced security using Stateful Packet Inspection (SPI) firewall Denial of Service (DoS) Protection and Intrusion Detection
- Supports Netgear's ProSafe Network Management Software NMS100 or any SNMP-based management software
- Optimised for use with Netgear ProSafe VPN Client Software VPN01L or VPN05L

R0166

\$369



NETGEAR™

harristechnology



Networking

GO GIGABIT!

GIGABIT LAYER 2 MANAGED SWITCH

NEW!



GSM7212

Fibre Gigabit Ethernet connectivity for flexible deployment. Netgear's GSM7212 delivers wirespeed Gigabit performance and a full set of Layer 2 management features with unsurpassed affordability. The non-blocking design offers full Gigabit throughput simultaneously to all 12 10/100/1000Mbps ports. Fibre connectivity is enabled through twelve hot-swappable combination Small Form-factor Pluggable (SFP) gigabit ports. Full Layer 2 management functionality provides the control you need for your network. L2 features include extensive VLAN support, traffic prioritisation, link aggregation, port mirroring, Rapid Spanning Tree, 802.1x, RADIUS, DHCP, broadcast storm protection, and more. Management features are configured with a Web browser, SNMP-based management software (such as the ProSafe Network Management System NMS100) or a command line interface accessed via serial, Telnet or SSHv1/v2. Remote management option reduces the need for on-site administration. Easy to use, it's configured for plug-and-play right out of the box. Now you can afford to add Gigabit performance anywhere in your network.

Rent* \$19.60/wk

R5825

\$1,749

16 PORT 10/100/1000Mbps GIGABIT SWITCH



GS116

- Non-blocking bandwidth for 16 Gigabit Ethernet ports for maximum throughput
- Small size & price make it ideal for small offices, departments, and workgroups
- Standards based technology makes it easy to mix 100Mbps and 1000Mbps devices

Rent* \$8.39/wk

P0140

\$749

GIGABIT PC CARD



GA511

- Transfer even the largest video files at blazing speeds
- Supercharge your network with Gigabit Ethernet – fast enough to send even the largest CAD, simulation, or database files
- Setup made easy with a new Smart Wizard install assistant GA311 PCI version also available

Q2474

\$89

24 PORT GIGABIT PROSAFE SMART SWITCH



GS724T

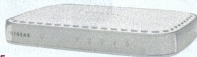
- 24 non-blocking 10/100/1000Mbps ports
- 2 SFP GBIC slots for fiber connectivity options
- Smart Management features for trunking, VLANs, and traffic prioritisation

Rent* \$15.86/wk

N3147

\$1,415

5 PORT GIGABIT ETHERNET SWITCH



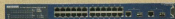
GS605

- Gigabit bandwidth for moving large files quickly
- Stylish Design- looks great flat or in provided stand
- Smart- honors 802.1p priority tags, great for VoIP applications

P0187

\$185

PROSAFE 802.11G WIRELESS ACCESS POINT



FSM7326P

24 port Layer 3 Managed 10/100 Switch

- 24 10/100 ports + 2 gigabit ports with fiber options Power over Ethernet (802.3af PoE), with redundant power supply port
- Full layer 2 and layer 3 management features set
- Can power both the wg302 and wg102 Wireless Access Points and supports VoIP phones
- Dynamic routing and QoS capabilities enable VoIP, video conferencing, and more
- GUI and CLI management interfaces for data and power

Rent* \$23.77/wk

M3150

\$2,299

PROSAFE 802.11G WIRELESS ACCESS POINT



WG302

- High-speed networking with IEEE 802.11g, up to 108Mbps in turbo mode
- Powerful RF management and control with AutoCell technology
- Wi-Fi Protected Access (WPA), 802.11i-ready security
- Wireless Distribution System (WDS) support bridging and repeater modes
- Integrated IEEE 802.3af Power over Ethernet (PoE)
- 2 detachable 5 dBi antennas

L8310

\$449

*RENTSMART

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BROADBAND SOLUTIONS FROM NETCOMM

PERSONAL VPN ROUTER

VPN100



The VPN100 is pocket-sized VPN hardware solution that provides secure access to network resources remotely from a hotel or another office via the internet. Advanced security features such as an active Stateful Packet Inspection firewall and DES/3DES ensures the most effective data security and data integrity.

N2957

\$129

WEB-BASED MANAGED SWITCHES

NetComm's Web Smart Gigabit Switches come with auto-sensing of 10/100/1000Mbps network speeds. They feature full/half-duplex auto-negotiation, MDI/MDIX cross over and utilise the intelligent Store-and-Forward switching method for optimal network performance. They also provide a host of Web based management features such as, VLAN, Trunking, Port-Mirroring, Port-Based QoS, Ports Setting for Speed/Disable, flow control and reporting tools.

NP3016

16 port switch

Rent* \$10.07/wk

P2350

\$899



NP3024

24 port switch

Rent* \$11.19/wk

P2351

\$999



*RENTSMART

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MY NET FONE (WITH PHONE PROVIDER BUNDLE)

V100LS

NEW!



Voice over Internet Protocol (VoIP) is the new rage which allows you to make voice phone calls over the Internet! NetComm's V100 VoIP Analogue Telephone Adaptor (ATA) is designed to connect a standard telephone handset and a cable or DSL Modem/Router to access a broadband connection. It is ideal for residential and small business users to deliver industry standards telephony over the Internet. The V100 delivers reliable, real-time Internet voice calls with the quality expected from normal telephone services.

R6466

\$139

ADSL/ADSL2 ETHERNET MODEM/ROUTER

NB5



This is the future-proof ADSL modem and router that you need to activate, operate and share a broadband ADSL Internet service today - and into the future. The NB5 includes an Active Firewall with Stateful Packet Inspection, VPN passthrough, Universal Plug & Play (UPnP), Quality of Service (QoS) and Easy Config. Best of all, when your ADSL service is upgraded to ADSL2, you can upgrade your NB5 with a simple download.

P7335

\$129

11G WIRELESS FIREWALL VPN ROUTER

NB5540



The NB5540 Wireless Router combines an integrated 54Mbps Wireless Access Point, Router and 4 port 10/100 Switch. It features an advanced SPI Firewall with 128Bit Wireless Encryption, and supports automatic VPN pass-through. Alternatively you can use the five built-in IPsec endpoints to join to other office networks. For existing 11Mbps wireless networks, the NB5540 is also backward compatible.

J8540

\$125

ADSL ETHERNET USB MODEM/ROUTER

NB3



The NB3 ADSL Modem/ Router employs the latest ADSL protocols and has been thoroughly tested for full compliance with Australian conditions. Connection is easily established through USB for a single PC, or 10/100 Ethernet to share an ADSL connection. The NB3 supports Universal Plug and Play and comes with an easy-to-read manual, installation guide and video tutorials for quick and easy set-up.

Q2024

\$89

108 SUPER G WIRELESS GATEWAY

NB620W

LOW PRICE



State-of-the-art Wireless Gateway with 802.11g wireless standard for high speed transfer rates up to 54Mbps, as well as Atheros' Super-G mode to turbocharge your transfer rates. Triple security with NAT and SPI/DoS firewalls, WEP and WPA. 2 x USB ports to support USB drives, printers & web cameras. Backwards compatible with 11Mbps, 802.11b wireless networks and complete with 4 port 10/100 Base-TX Ethernet Switch.

Q4600

\$269

LOAD BALANCING ADSL AGGREGATOR

NB740



Combines the performance of two broadband connections in a single, easy to manage network gateway. The NB740 determines how Internet traffic is shared or it can automatically balance the load according to bandwidth usage levels. It also offers redundancy through the use of two WAN connections from different ISPs.

N6026

\$399

BELKIN ACCESSORIES

TOP LOADING XL CASE

**HOT
PRICE**



- Lightweight, durable honey-comb constructed frame
- Fits plenty of essentials from business cards to pens and accessories
- Special double-elastic softness strap and ergonomic handles
- Professional, stylish look

L4284

\$89

EXECUTIVE SERIES LEATHER CASE



- Stylish lines and sturdy construction
- Fine grade leather exterior crafting
- Ergonomic shoulder strap and handles for easy lifting
- Tough-protection, honeycomb construction

L4280

\$99

WIRELESS OPTICAL MINI MOUSE



- Comes with an on-off switch
- Offers precision tracking and RF operation- wirelessly
- Features a compact, smaller and lighter design

H5027

\$69

OPTICAL MINISCROLLER MOUSE



- 3 button with scroll wheel
- Engineered with the latest optical components
- Beyond the mouse pad! The MiniScroller™ adapts to virtually any surface
- No more rubber ball! The embedded optical sensor has absolutely no mechanical parts to clean

J3017

\$29

USB 4 PORT MOBILE THUMB HUB



- Packs and travels easily with compact design and portability
- Connects up to 4 USB devices through your computers USB connection
- Offers the ease and reliability of USB data transfers

L7708

\$24

USB 2.0 4 PORT MOBILE THUMB HUB



- Features compact, travel-friendly design
- Connects 2 high-speed devices without a power supply
- Connects up to 4 high and low speed devices
- Includes global-use power supply and USB extension
- Complies with OHCI, EHCI and USBIF standards

J2213

\$59

USB 2.0 4 PORT HUB

**\$49
LIMITED
TIME
OFFER**



The Hi-Speed USB 2.0 4 Port hub allows you to connect up to 4 ultrafast devices such as next-generation scanners, printers and video cameras. Small and stackable, it is the ideal accessory for your desk. Travel lighter and transfer quicker with the Hi-Speed USB 2.0 Pocket Hub from Belkin.

This USB innovation from Belkin lets you connect up to four peripherals quickly and easily. The Hi-Speed USB 2.0 4 Port hub provides four downstream USB ports that offer Plug-and-Play connectivity to your USB 1.1 (low-and full-speed) and USB 2.0 (high-speed) devices. This includes such peripherals as scanners, printers, mass-storage drives, and high-resolution cameras.

ADVANTAGES :

- Offers stackable, reversible design
- Features four 480Mbps ports and transfers your data at up to 480Mbps
- Prevents damage to your computer and devices with over-current protection
- Connect up to 2 high-speed devices without a power supply
- Installs easily with Plug-and-Play convenience, supports "hot swapping" of all your USB devices
- Lets you monitor port and power status with LEDs

M3731

\$49

PLEASE NOTE:

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USB - STORAGE & CONNECTIVITY

USB 2.0 QUICKLINK
5-IN-1 CABLE

USB2-QL-02

QuickLink Connectors for all your USB devices. Complete with 2 metre cable & easy carry pouch. Five Different USB Cable Configurations

- A Male to B Male
- A Male to A Female
- A Male to Mini B Male
- Mini A Male to B Male
- Mini A Male to Mini B Male

P9191

\$29

CARDBUS ADAPTERS



- Instantly add High-Speed USB 2.0 ports or IEEE1394 FireWire ports to your notebook.
- Quick & easy installation - ideal for any mobile executive.
- Hot-pluggable with full Plug-and-Play support.
- Supports 32 bit CardBus PC Card type II slots.

N2270 2 Port USB 2.0 \$55

N2272 3 Port FireWire \$55

P2062 4 Port Combo \$99

PLEASE NOTE:

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COMSOL USB 2.0 FLASH DRIVES



Front view



Back view

- Password protection for sensitive data
- FlashMail function for portable email
- PCLock function prevents unauthorised access to your computer
- SecretZip function compresses and encrypts data for increased capacity and added security

Q5460 256MB \$66

Q5461 512MB \$99

Q5462 1GB \$179

USB TO INFRARED ADAPTER



Convert your USB port into Infrared.

UIR-120

N0930

\$69

5 PORT USB 2.0 PCI
HOST ADAPTER

5 port USB 2.0 PCI controller card.

UPCI-502

N2275

\$39

USB TO BLUETOOTH ADAPTER



Add Bluetooth capabilities to your notebook or desktop PC.



UBT-122

Q7429

\$75

USB 2.0 HDD 3.5" IDE
ENCLOSURE

Don't throw away your old 3.5" hard drive. Drop it in to this enclosure for a portable drive.

UHD-3502

N0960

\$99

NEED MORE USB 2.0 PORTS?

With the Comsol USB 2.0 Pocket Hub or Desktop hub you can rest assured that you will have a spare port to plug your USB device into.

4 PORT USB 2.0 POCKET HUB



USB 2.0 high-speed pocket hub.

UPH-402

N2301

\$55

4 PORT USB 2.0 DESKTOP HUB



USB 2.0 high-speed desktop hub.

UDH-402

N2302

\$55

INTELLIGENT KVM SOLUTIONS

SERVERLINK ELITE BUNDLES



INCLUDES
ALL REQUIRED
2 METRE
CABLES

SL-841-P



INCLUDES
ALL REQUIRED
2 METRE
CABLES

SL-1641-P

Using high-density connections, these 8 and 16 port KVM switches use only 1U of rack space making them ideal for any server room where space is at a premium.

The Elite KVM switches feature a user-friendly pop-up screen menu control, yet requires absolutely no software. The On-Screen-Display enables you to rename your computers to make selection quick and simple. Select any computer directly from your keyboard using simple hot-key commands.

SL-841-P Rent* \$6.71/wk

P2748 8 PORT SERVERLINK ELITE KVM (INCLUDES: 8 X PS2/VGA CABLES) **\$599**

SL-1641-P Rent* \$10.07/wk

P2749 8 PORT SERVERLINK ELITE KVM (INCLUDES: 16 X PS2/VGA CABLES) **\$899**

SERVERLINK IP ADD REMOTE IP ACCESS TO YOUR CURRENT KVM SWITCH



ServerLink IP adds economical remote access capability to existing KVM switches. With secure, browser-based access, you can have BIOS-level, console access to multiple servers anywhere, anytime.

- BIOS level access to servers via TCP/IP
- Browser-based access to your server
- 128 bit SSL encryption ensures secure remote connection
- Flash upgradeable for quick updates

Rent* \$12.94/wk

Q5544 SL-1000 **\$1,155**

SERVERLINK RACK DRAWERS



INCLUDES
ALL REQUIRED
2 METRE
CABLES

17" LCD
ALSO
AVAILABLE

Includes a 15" TFT LCD screen, keyboard, touchpad and integrated KVM switch. These LCM KCM switches save you up to 1/3 of valuable rack space.

Rent* \$24.81/wk

H2100 SINGLE PORT PS2/VGA **\$2,399**

Rent* \$27.91/wk

H2101 8 PORT KVM - PS2 /VGA **\$2,699**

Rent* \$32.81/wk

H2103 16 PORT KVM - PS2/VGA **\$3,199**

SERVERLINK STAR KVM SWITCHES WITH BUILT-IN CABLES



AUDIO
& MIC
SWITCHING

Control two PCs with a single keyboard, monitor and mouse. All ServerLink Star KVM switches have audio and microphone support for multimedia applications.

2 PORT PS/2 KVM

Q5539 **\$79**

2 PORT USB KVM

Q5540 **\$89**

2 PORT PS/2+USB KVM

Q5541 **\$85**

SERVERLINK SLIM KVM SWITCHES



CABLES
INCLUDED

Save desktop space from over-cluttering with the ServerLink Slim KVM. High Density 3-in-1 cables allow you to have a single connection at the KVM.

2 PORT KVM WITH CABLES

Q5542 **\$119**

4 PORT KVM WITH CABLES

Q5543 **\$199**

*RENTSMART

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POWER BACK-UP EQUALS POWER PROTECTION

APC BACK-UPS CS FOR WORKSTATIONS



Rear view

Best Value Battery Backup & Protection for Home and Business Computers

- Battery powered & surge protected power outlets
- Built-in phone/fax/modem line (DSL compatible) protection
- Safe system shutdown software
- Sophisticated power management features
- Easy access hot-swappable, user-replaceable battery

APC BACK-UPS CS 350VA/210W 230VC5446 **\$139****APC BACK-UPS CS 650VA/400W 230V**Q7196 **\$235****BACK-UPS ES 350/500****BACK-UPS ES 350VA**E1093 **\$189****BACK-UPS ES 500VA**E0709 **\$255*****RENTSMART**

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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COMPUTER AND HOME THEATRE SURGEARREST PRODUCTS

Lightening and power surges can permanently ruin your electronic equipment. The APC SurgeArrest product range will protect your equipment from the threat of power surges and disruptions. The SurgeArrest range provides maximum protection for your home/office environment including computers, printers, modems and home theatre systems.

ESSENTIAL SURGEARREST

Essential surge protection for computers and home electronics from lightning spikes and surges. Featuring 5 outlets, safety shutters, cord management and lifetime equipment protection policy up to \$75,000 with Data Recovery Warranty. Also available with Telephone/Fax/Modem, Cable Modem and Video Protection.



R1893

P5-AZ

\$39**HOME/OFFICE SURGEARREST**

Reliable surge protection for home or office computers and electronic equipment from lightning spikes and surges. Featuring 6 outlets including Telephone/Fax/Modem protection with 2-way Splitter, safety shutters, cord management and lifetime equipment protection policy up to \$125,000 with Data Recovery Warranty. Also available with Cable Modem and Video Protection.



R1889

PH6T3-AZ

\$65**PERFORMANCE SURGEARREST**

Complete Surge Protection for High Performance Computers and Electronics from lightning spikes and surges. Featuring 8 outlets including Cable Modem and Video Protection, Network Protection, Telephone/Fax/Modem protection with 2-way Splitter, safety shutters and cord management. Includes two 1.8 Meter Tel Cable, 60 cm Coaxial Cable, 6ft Network Cable, and lifetime equipment protection policy up to \$175,000 with Data Recovery Warranty.



R1884

PF8VNT3-AZ

\$89**APC SMART-UPS 1000VA 230V USB/SERIAL WITH POWERCHUTE BUSINESS EDITION****SPECIAL**

- Power protection for mission-critical applications**
- LED status display with on-line, on battery, replace battery and overload indicators
 - Auto Diagnostic Testing
 - Automatic Voltage Regulation (AVR)
 - CellGuard intelligent battery
 - Email/SMS notification
 - Network-grade line conditioning

Rent* \$12.16/wk

D9337

\$1,085**APC SMART-UPS 1000VA 230V USB/SERIAL RACKMOUNT UPS**

Includes PowerChute Smart-UPS software bundle Power protection for rack-mounted servers & networking equipment

Rent* \$13.88/wk

99596

\$1,239**OPTIONAL EXTRA:**

Three Years Next Business Day On-site Warranty Service

P5671

\$439

MAXTOR ONETOUCH II™ - SMART STORAGE WITH PUSH-BUTTON BACKUP

ONETOUCH II™ SERIES

The Maxtor OneTouch™ drive - just press the button and your files are backed up in one simple step. It's simply the faster backup. Faster than CD. Faster than a floppy. Faster than removable cartridge systems. Space for your photos, videos, graphics, music, documents and more. It connects to FireWire or USB ports on a PC or MAC. It backs up with the Maxtor OneTouch™ button or runs automated backups using the included software, Dantz® Retrospect® Express. And you can customise the button to launch any application. Powerful, yet simple backup. Fast, flexible, huge capacity.

FEATURES

- Patent-pending Maxtor OneTouch™ technology
- Plug and play storage
- Hot-swappable
- Anodised aluminum design
- Stands vertically or horizontally
- Dantz® Retrospect® Express backup software included
- Customisable Maxtor OneTouch™ button
- Power management and on/off switch
- Whisper-quiet FDB motor
- Connect additional drives
- Kensington security lock compatible



ALL NEW FEATURES

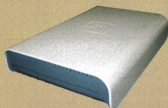
MAXTOR ONE TOUCH SERIES II UTILISES ALL THE FEATURES OF THE ORIGINAL MAXTOR ONE TOUCH SERIES AND COMBINES THEM WITH THESE GREAT NEW FEATURES:

- Default installation backs up every local drive automatically
- Saves historical backup versions
- Full system restore to an earlier version
- Simple diagnostics check the health of your drive with a single click
- Tuneable drive performance

QUICK AND EASY INSTALLATION

- 1 INSTALL THE SOFTWARE
- 2 PLUG IN THE DRIVE
- 3 PUSH THE BUTTON AND FOLLOW ON-SCREEN DIRECTIONS

MAXTOR PERSONAL STORAGE 3100



THE EASY ECONOMICAL WAY TO ADD STORAGE

The Maxtor Personal Storage 3100 external hard drive provides instant storage to hold digital photos, music and data files. Ideal for the home and office, it's simple to install - just plug the external drive into an available USB port on your Windows PC and immediately get up to 80GB of extra space. Use the extra capacity to free up the space on your PC or to add more of your favorite files - the 80GB drive can hold up to 75,000 digital photos (JPEG normal) or up to 1650 hours of digital music (MP3). The Personal Storage 3100 offers a dependable Maxtor hard drive for easy add-on storage to hold your important documents and precious memories. It works with both the fast USB 2.0 interface and USB 1.1.

FEATURES

- Easy installation
- USB 2.0 & 1.1 compatible
- USB 2.0 up to 40 times faster than USB 1.1
- Compact Design
- Powered by a dependable Maxtor® hard drive
- Windows PC compatible

R3323	100GB (USB 2.0)	\$229
R3322	200GB (USB 2.0 + FIREWIRE)	\$349
Q3145	250GB (USB 2.0 + FIREWIRE)	\$399
Q3146	300GB (USB 2.0 + FIREWIRE)	\$449

R3509 80GB

\$149

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

DUAL LAYER DVD WRITERS

FEATURES:

PRECISION RECORDING TECHNOLOGY

Pioneer's exclusive performance enhancing features ensure high quality recording characteristics and low operational noise.

ULTRA DYNAMIC RESONANCE ABSORBER

Absorbs vibration caused by imbalanced media. Stabilises media for higher quality writing and quieter read performance even at high speed.

LIQUID CRYSTAL TILT / THICKNESS COMPENSATOR

Provides accurate, reliable read/write performance with a variety of disc characteristics. The Liquid Crystal Compensator is an ideal solution for irregularly curved, thin/ thick and double layer discs.

PERFORMANCE ADJUSTING FIRMWARE

Automatically adjusts between Performance mode and Quiet mode. Achieves an ideal solution by lowering disc rotation for quieter drive performance during DVD Video and Audio CD playback, while speeding up for high performance when required.

NOTE: Software supplied is not MAC compatible.

PLEASE NOTE:

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INTERNAL DUAL DVD/CD WRITERS
MODEL DVRA09XL

The Pioneer DVR-A09XL is the industry's first DVD writer to support dual layer recording at 6X. This enables the recording of a full 8.5GB dual layer disc in around 20 minutes.

FEATURES:

Industry leading recording speeds of 16X for Single Layer and 6X for Dual Layer combined with Pioneer's proven reliability and support.

INCLUDED SOFTWARE:

Comprehensive quality Ulead package featuring DVD MovieFactory 3.5 Suite Deluxe, DVD Workshop 2 SE, VideoStudio 8 SE DVD (all including Dolby AC-3 audio encoding) and DVD PictureShow 3 SE.

WRITE SPEEDS

- 16x DVD±R
- 6x DVD Dual Layer
- 40x CD-R
- 24x CD-RW



R0657

BEIGE

\$169

R0658

BLACK

\$169

INTRODUCING IMATION DUAL LAYER MEDIA

IMATION CD-RW 10x-24X 650MB/74MIN 5 PACK REGULAR JEWEL CASE



N2988 **\$10**

IMATION CD-R 52x 700MB/80MIN 100 SPINDLE + 10 BONUS PACK



Q1890 **\$49**

IMATION TRAVAN TR-40 20GB/40GB



Image for illustration purposes only

J6181 **\$69**

IMATION DISC STAKKA



- Perfect for business, studio and home use, with the Disc Stakka you need never waste time searching for a disk again!
- Stores, protects and retrieves up to 100 of your favourite CDs or DVDs.
- Fully motorised disc insert and eject helps protect your valuable discs.
- Simple to set up, linking to your computer via a single USB cable.
- Supplied with powerful OpDiTracker Disc Management Software - use to capture disc content, and then search an entire database of stored discs by title, keyword, directory or file name.

M4871

\$185

IMATION DVD-R 8x 4.7GB 25 SPINDLE + 2 BONUS PACK



Q1891 **\$27**

IMATION DVD+R 8x 4.7GB 25 SPINDLE + 2 BONUS PACK



Q1892 **\$27**

IMATION 4.7GB 8X DVD+R MEDIA - 5 PACK



P2907 **\$7**

IMATION DVD+R 4.7GB 4X DVD+R MEDIA - 10 PACK SLIM MOVIE CASE



P2906 **\$14**

IMATION 4.7GB 4X DVD-R INKJET PRINTABLE MEDIA - 25 DISC SPIN



Image for illustration purposes only

P2905 **\$27**

IMATION BLACK WATCH ULTRIM LTO 3 400GB/800GB TAPE CARTRIDGE



R3749 **\$199**

PLEASE NOTE:

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STORE YOUR WORLD IN OURS

CRUZER MICRO
FLASH DRIVES256MB
\$49

- Small size and easy to use
- Hi-Speed USB 2.0 certified for fast data transfer (compatible with USB 1.1)
- Two extra colour caps and a neckstrap included

P0697 128MB USB 2.0 **\$39**P0698 256MB USB 2.0 **\$49**P0699 512MB USB 2.0 **\$94**CRUZER MINI FLASH
DRIVESMALL SIZE
LARGE CAPACITYGREAT
PRICE

- Small size and easy to use
- No drivers required
- Hi-Speed USB 2.0 certified for fast data transfer (compatible with USB 1.1)
- Store all your data, pictures, music and more
- Two extra colour caps and a neckstrap included

P5250 1GB USB 2.0 **\$159**

PLEASE NOTE:

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SANDISK DIGITAL MP3 AUDIO PLAYERS

A small, portable player that uses embedded flash memory instead of a rotating hard drive and plays for up to 15 continuous hours on a single AAA battery. The new Digital Audio Players combine crystal-clear sound with a sleek design and sport a three-button/one-joystick design and easy-to navigate user interface. They feature MP3, Windows Media® file and Windows Media-based DRM file playback, FM radio and voice recording and can double as a USB data storage device.

BLUE - 512MB

Features:

- Plays MP3, WMA, and WMA DRM
- Digital FM tuner with 20 preset stations
- Voice Recorder with built-in microphone
- Hi-Speed USB 2.0 port for fast and easy transfer of files
- Up to 15 hours continuous playback using one AAA battery (included)
- Indigo backlit multi-line LCD display



NEW!

R7172 SANDISK DIGITAL MP3 AUDIO PLAYER BLUE - 512MB

\$199

SANDISK 12 IN 1 READER

The ImageMate 12-in-1 Card Reader/Writer is a hi-speed USB 2.0 Multi-card Reader/Writer that connects to your computer's USB 2.0 port. USB 2.0 provides superior performance to transfer pictures, music, video and data between flash memory cards and your computer.

The ImageMate 12-in-1 provides the ability to write data to and read data from flash memory without connecting your digital device (digital camera, handheld computer, digital music player, etc.) directly to a computer.

The ImageMate 12-in-1 Reader/Writer accepts the following memory types without the need for an adapter:

1. CompactFlash Type I
2. CompactFlash Type II
3. SD Card
4. miniSD
5. MultiMediaCard
6. RS-MMC
7. Memory Stick
8. Memory Stick PRO
9. Memory Stick Duo
10. Memory Stick PRO Duo
11. SmartMedia
12. xD



R0317 SANDISK 12 IN 1 READER WITH BUTTON

\$58

SEAGATE EXTERNAL HARD DRIVES

EXTERNAL HARD DRIVE 3.5" 7200 RPM FIREWIRE/USB 2.0



HIGH CAPACITY, AMAZING PERFORMANCE

These high capacity drives make it easy to store and backup your data. You can safely store business files, movies and photos, the latest games, your favourite music and more. And the interlocking design lets you securely expand your Seagate storage.

ENGINEERED FOR HIGH PERFORMANCE

7200 RPM drive with 8MB cache and whisper quiet motor lets you effortlessly store and work with massive amounts of data.

BUILT FOR SAFETY AND SECURITY

Seagate hard drives are safeguarded by built in self monitoring technology that continuously checks your hard drive for data safety and drive performance. SeaTools diagnostic software is included.

WORRY FREE, ONE YEAR WARRANTY

Warranty covers all parts and labour.

DRIVE SPECIFICATIONS

- 8MB cache
- 7200 RPM
- 350 Gs non-operating shock resistance
- Mac and PC compatible

PORTABLE DRIVE 2.5" EXTERNAL 5400 RPM USB 2.0



EXCEPTIONAL PORTABILITY AND PERFORMANCE

Enjoy easy storage and access of large digital music, photos, video, data and multimedia files both on the desk and on the go.

ENGINEERED FOR HIGH PERFORMANCE

This 5400 RPM hard drive features a whisper quiet SonicSoft FDB motor, and delivers 50 percent more performance than 4200 RPM drives - with no increase in power consumption. You get higher speed while conserving battery life.

FAST AND EASY

Supports speeds up to 480Mbps, is hot swappable and powered by the USB bus - there's no need for power cords or adapters.

BUILT FOR SAFETY AND SECURITY

Seagate hard drives are safeguarded by built in self monitoring technology that continuously checks your hard drive for data safety and drive performance. SeaTools diagnostic software is included.

WORRY FREE, ONE YEAR WARRANTY

Warranty covers all parts and labour.

DRIVE SPECIFICATIONS

- 2MB cache (40GB) / 8MB cache (100GB)
- 5400 RPM
- 5000 Gs non-operating shock resistance
- Mac and PC compatible

5GB POCKET HARD DRIVE USB 2.0



The Seagate 1-inch external hard drive is the biggest small hard drive on the planet, with up to 5GB capacity. Breaking traditional cost/performance barriers, this innovative solution is available in a cool looking, USB 2.0 bus powered design. This 1-inch external drive is optimised to deliver high performance, low power consumption and reliability in a compact physical package.

APPLICATIONS

- Robust design and high shock tolerance enable mobility in demanding operating environments
- Best solution for highly portable data transfer
- Great for carrying music, photos and business files
- One year manufacturer warranty

Q3001

\$299

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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R3676 160GB **\$299**

R3677 200GB **\$349**

R3678 300GB **\$449**

Rent* \$6.71/wk

R3679 400GB **\$599**

R3680 40GB **\$299**

Rent* \$6.71/wk

R3682 100GB **\$599**



STORAGE SOLUTIONS

**Porsche EXTERNAL
DVD±R/±RW/DUAL
LAYER**


LaCie new dual layer & dual format DVD±R designed by FA Porsche now burns 5 different DVD formats & 2 CD formats. LaCie Porsche Slim DVD±R drives come in a small sleek casing bus powered through USB 2.0 or FireWire. No power supply required.

P8473

\$249
**Porsche EXTERNAL
Double-Layer 8x
DVD±R/RW USB 2.0
BUS POWERED**


- Large 8.5GB storage capacity
- Dual DVD formats - DVD-RW and DVD+RW
- Hi-Speed USB 2.0 interface
- Easily share among Windows and Mac systems

P8475

\$329**PLEASE NOTE:**

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**Porsche EXTERNAL USB 2.0
MOBILE DRIVES**


NB: The key is not included

LaCie mobile drives, designed by FA Porsche, are the perfect companion to back up your notebook or use to transfer data from one computer to another. Made of magnesium and bus powered through the USB 2.0 or firewire port. Weight only 200g and is 1.7 x 7.6 x 1.3cm in size.

BENEFITS

- Lightweight, portable design
- Hi-Speed USB interface
- AC adapter free - powered by USB bus
- Back up files on the road

SPECIFICATIONS

- Capacity: 40GB
- Interface: Hi-Speed USB
- Interface Transfer Rate: 480Mbps/s
- Rotational Speed (rpm): 4200
- Size: 17 x 76 x 129mm / .65 x 3 x 5 in. (HxWxL)
- Weight: 200g / 7.05 oz.
- Seek Time: <12 ms
- Buffer: 2MB

**40GB Porsche EXTERNAL
USB 2.0 MOBILE DRIVE**

L8434

\$209
**60GB Porsche EXTERNAL
USB 2.0 MOBILE DRIVE**

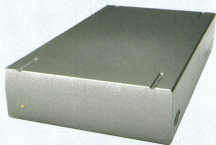
N6429

\$279
**80GB Porsche EXTERNAL
USB 2.0 MOBILE DRIVE**

L8435

\$349
**100GB Porsche EXTERNAL
USB 2.0 MOBILE DRIVE**

Q0364

\$469
**Porsche EXTERNAL USB 2.0
DESKTOP DRIVES**


Featuring a slim, portable body, LaCie Hard Drives were precision-engineered to deliver the performance of a race car. Blazing-fast speeds let you transfer home videos from a camcorder, save MP3s, back up your hard drive or download digital photos in minutes.

BENEFITS

- Save photos, MP3s, data files
- Stackable to save desk space
- Hi-Speed USB connection
- Back up valuable information

SPECIFICATIONS

- Capacity: 80GB
- Interface: Hi-Speed USB (USB 1.1 compatible)
- Interface Transfer Rate: 480Mbps/s
- Rotational Speed (rpm): 7200
- Size: 35 x 112 x 188mm / 1.4 x 4.4 x 7.4 in. (HxWxL)
- Weight: 900g / 31.7 oz.
- Seek Time (write): <11 ms
- Buffer: 2MB
- Max sustained transfer rate: up to 34MB/s
- Box Contents: Hi-Speed USB cable, External AC power adapter, LaCie Utilities CD-ROM

**80GB Porsche EXTERNAL
USB 2.0 DESKTOP DRIVE**

L8441

\$199
**160GB Porsche EXTERNAL
USB 2.0 DESKTOP DRIVE**

L8442

\$259
**250GB Porsche EXTERNAL
USB 2.0 DESKTOP DRIVE**

L8724

\$349

harris**technology**

Accessories

CORDLESS AND OPTICAL COMBINATIONS**CORDLESS OPTICAL MOUSE BLACK**

Enjoy freedom from snagged and tangled mouse cords with the Logitech® Cordless Optical Mouse. Setup is a breeze - just plug the receiver into your PC or Mac. Reliable cordless technology, smooth optical tracking, and extended battery life ensure great performance. USB and PS/2. 5 year manufacturer warranty.

N1387

\$42**LOGITECH CORDLESS CLICK! PLUS**

Never worry about batteries. The Logitech® Cordless Click!™ Plus Rechargeable Optical Mouse features a rechargeable battery system that eliminates the need to replace batteries. Other features include a tilt wheel with zoom for side-to-side scrolling and in/out zooming. Universal forward/back buttons help you move through document or web pages faster. USB and PS/2. 5 year manufacturer warranty.

Q5017

\$83**V500 CORDLESS NOTEBOOK MOUSE**

Logitech's V500 Cordless Notebook Mouse delivers maximum performance in a sleek, ultra-thin design. With its revolutionary expandable chassis balancing comfort and mobility, 4-way scroll panel for vertical and horizontal scrolling, storable 2.4 GHz micro receiver, and an all-terrain optical engine, the V500 sets the standard in enterprise-class cordless performance. USB connection.

Q5016

\$99**CORDLESS DESKTOP EXPRESS**

Ready, set - go cordless. Logitech's easy set-up cordless keyboard and mouse combination gives any user the perfect blend of quality, performance, and affordability. The Cordless Desktop Express™ offers convenient one-touch keyboard controls for Web access or e-mail, and precise optical mouse performance. Your work space will be easier to manage too.

Q2404

\$59**LOGITECH CORDLESS DESKTOP LX 300**

The Logitech® Cordless Desktop® LX 300 cleans up your work space, and empowers your style. Control music and video playback, open e-mail or Instant Messenger, or navigate the Web directly from the keyboard. Distinctive F-keys are programmable. Premium cordless optical mouse tracks precisely, while a new ultra-flat keyboard delivers leading-edge comfort.

R3185

\$87**LOGITECH X-230 2.1 SPEAKERS**

Crank up the PC audio with Logitech's X-230 speaker system. Its dual driver satellites eliminate uneven response created by conventional dual driver designs using FDD2TM technology. The ported subwoofer features a real-time equalizer that maximises punch while minimising distortion. The X-230 speaker system also has convenient volume and subwoofer level controls.

P3348

\$76**QUICKCAM EXPRESS**

Meet face-to-face online by making live video calls. Snap and send photos as easily as you send text. You can even shoot and send video e-mail. No camera is necessary at the other end.

K8501

\$65**QUICKCAM IM**

QuickCam IM includes a bonus headset for private conversations and a bonus clip for notebooks & flat panel monitors. Capture videos and photos and e-mail them in one simple click.

N9485

\$89**MOBILE FREEDOM HEADSET**

This lightweight Bluetooth headset has the performance you need to stay in touch anywhere you go.

Q5788

\$79**MOBILE PRO HEADSET**

Quickly and easily hear and operate the high performing Logitech Mobile Pro Headset.

R5968

\$129**PLEASE NOTE:**

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

CD/DVD PRODUCTION

BRAVOPRO DUPLICATE PRINT

PRIMERA
TECHNOLOGY INC.

BravoPro

- Professional, all-in-one CD/DVD publishing on your desktop
- Totally automated and hands free
- 2 Burning Drives & 4800dpi printer
- Afterburner Print Technology for fastest throughput in its class
- 100 disc capacity
- Networking Software included
- PC and Mac platform software included

Rent* \$48.90/wk

Q9576 2 CD-R **\$5,299**

Rent* \$55.36/wk

Q9577 2 DVD±R **\$5,999**

RIMAGE 2000i CD AND DVD PUBLISHERS



RIMAGE™

- 2 drives CD or DVD
- 100 disc capacity
- Incorporates new 480i CD/DVD Printer
- Network software supports PC or MAC clients
- Up to 2 units on one PC
- Plug and Play

Rent* \$ 53.51/wk

N2212 2 CD **\$5,799**

Rent* \$59.97/wk

N2213 2 DVD **\$6,499**

*RENTSMART

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COPYSMARTBLAST DVD DUPLICATORS

- Burn discs fast with these new speedy stand alone duplicators
- Up to 16x DVD with DL support
- Ranging from 3 to 7 drives simultaneously burning
- Built-in 120GB Hard Disk with new USB 2.0 PC connection for image management.


 NOW
UP TO 16X
DVD!

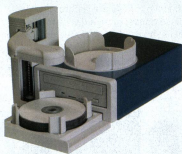
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 SUPPORTING
DUAL LAYER
DVD!

Q2085	3 DVD±R	Rent* \$17.92/wk	\$1,599
Q2086	5 DVD±R	Rent* \$24.64/wk	\$2,199
Q2087	7 DVD±R	Rent* \$26.88/wk	\$2,599

MINI CUBIS DUPLICATOR



THE WORLD'S SMALLEST AUTOMATED DUPLICATOR!

This compact device automatically loads, burns and unloads up to 25 discs at a time. Also compatible with business card and 8cm discs.

Rent* \$ 10.07/wk

Q2015 1 CD-R **\$899**

Rent* \$13.43/wk

Q2051 1 DVD±R **\$1,199**

PRONTO DUPLICATOR



Fast, small and easy to use, Pronto works without a PC and copies up to 100 discs unattended.

Rent* \$16.80/wk

L1539 1 CD-R **\$1,499**

Rent* \$25.12/wk

N9439 1 DVD±R **\$2,429**

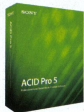
MULTIMEDIA

Multimedia

SONY SOFTWARE SOLUTIONS & HAUPPAUGE TV TUNERS

SONY SOFTWARE

ACID PRO 5



ACID Pro software is the original loop-based music creation application. Intuitive "pick, paint, and play" interface. Advanced professional features. Includes over 1,000 royalty-free loops.

R1492

\$439

VEGAS 5



Vegas software is the all-in-one, real-time solution for professional digital video and audio production, streaming content creation, and broadcast production on the PC platform.

N5573

\$749

SOUND FORGE 8



New Sound Forge 8 software is the professional's choice for audio editing, recording, effects processing, streaming content creation, and more. Real-time editing and more

R1865

\$439

VEGAS+DVD PRODUCTION SUITE



The Vegas+DVD Production Suite includes Vegas, DVD Architect™, and Dolby Digital® AC-3 encoding software. Perfect for the professional media producer, it's everything you need to seamlessly edit video and audio, produce 5.1 surround mixes, encode to AC-3 file formats, and author DVDs on the PC platform. Vegas software is a comprehensive solution for scalable HD and DV production, sound editing and mixing, streaming content creation and 5.1 surround production. With Dolby Digital AC-3 Encoder software you can encode surround sound mixes to stereo or multichannel AC-3. DVD Architect software lets you develop menu-based DVDs, music compilations, movies, and slideshow presentations.

N8034

\$1,135

SOUND FORGE AUDIO STUDIO



Sound Forge Audio Studio software lets you record, create, and edit music on your PC. Apply over 30 built-in effects and processes. Built-in CD burning software.

Q3125

\$159

ACID MUSIC STUDIO



ACID Music Studio software lets you create original music on your PC. Create mixes and remixes using studio-quality loops and effects. Record and edit live performances.

Q3124

\$159

VEGAS MOVIE STUDIO+DVD



Vegas Movie Studio+DVD software makes it easy to capture and edit digital video on your PC. Create movies, slideshows, presentations, and burn your own DVDs.

Q3123

\$189

HAUPPAUGE TV TUNERS

HAUPPAUGE USB2



Watch TV on your desktop Composite or SVHS Input for camcorder or FoxTel input.

FM Radio model also available.

Q2054

\$219

HAUPPAUGE NOVA-T



Digital TV Tuner Card
High Definition (HD) and Standard Definition (SD) reception. Record to disk and playback digital TV, very high quality picture and sound schedule, TV recording for later viewing, burn television programmes to DVD (requires DVD burning software.)

K8172

\$255

HAUPPAUGE NOVA-T USB2



External USB2 Digital TV Tuner
High Definition (HD) and Standard Definition (SD) reception via external USB2 hardware. Record to disk and playback digital TV, very high quality picture and sound schedule, TV recording for later viewing, burn television programmes to DVD (requires DVD burning software.)

R7457

\$229

HAUPPAUGE EXPRESS TV



Watch TV on your desktop Composite Input for camcorder or FoxTel input.

M9423

\$89

PLEASE NOTE:

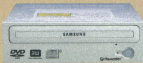
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SYNCMaster LCD MONITORS

COMBO DRIVE
52X 32X 52X CDRW
16X DVD

- Speeds ranging up to 52x writing, 32x rewriting, 52x CD reading, and 16x DVD reading
- EIDE/ATAPI interface
- High capacity buffer memory of 2MB
- Can be mounted both horizontally and vertically
- 2 year return to base manufacturer warranty

R1747 BLACK \$69
R1690 BEIGE \$69

DVD+/-R/RW 16X
EIDE DOUBLE LAYER

Whether it be a mountain of music, a home movie of epic proportions or a lifetime of digital memories, the sky's the limit with Samsung's new dual layer DVD burner. Store almost twice as much as standard DVD writers at blistering speeds, including 16x DVD+R, 12x DVD-R, 32x CD-RW and 48x CD-ROM. The Samsung 16x WriteMaster is head and shoulders above the rest.

- 1 year return to base manufacturer warranty

R1703 BLACK \$119
R1741 BEIGE \$119

*RENTSMART

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PLEASE NOTE:

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SAMSUNG 710V 17" TFT



- Pixel pitch: 0.264mm
- Contrast ratio: 500:1
- Viewing angle (H/V) 150° degrees / 120° degrees
- Response time: 25ms
- Analog interface
- 1280 x 1024 maximum resolution

SPECIAL FEATURES

- Built-in Power, Magic Tune, Safe Mode (Down Scaling up to UXGA), MagicBright

N6450 BLACK \$449

N6451 SILVER \$449

SAMSUNG 913N 19" LCD



- Pixel pitch: 0.294mm
- Contrast ratio: 700:1
- Response time: 8ms
- Viewing angle: 160°/160°
- Analog interface
- 1280 x 1024 maximum resolution
- 3 year on site exchange and zero dead pixel policy*

SYNCMaster
913N FASTEST
RESPONSE TIME
OF 8MS

R2978

SILVER

\$790

Rent* \$8.85/wk

*Please contact Samsung Electronics Australia on 1300 362 603 or email: monitor.service@samsung.com for full Terms & Conditions.

LEADERS IN VISUAL DISPLAY TECHNOLOGY



19" LCD MONITOR

ACCUSYNC LCD92V

- 1280 x 1024
- Analogue input
- Wide viewing angle
- Thin frame design

Rent* \$8.95/wk

Q5546 WHITE **\$799**

Rent* \$8.95/wk

Q5545 BLACK **\$799**

17" LCD MONITOR

Rapid Response™ delivers uninterrupted video. NaViSet™ intuitive display settings control. Slim footprint increases desktop space. Choice of white or black cabinet. Low energy consumption saves money. Rest easy with 3 year limited manufacturer warranty.



ACCUSYNC LCD72V

- Screen/viewable size: 17"
- Native resolution: 1280 x 1024
- Brightness (typical): 250 cd/m2
- Contrast ratio (typical): 450:1
- Response time (typical): 16ms

Q2328 WHITE **\$449**

Q2329 BLACK **\$449**

NEC PORTABLE LCD PROJECTORS



VT47G

- 1500 ANSI lumens
- SVGA Resolution
- Compact 2.9kg
- Lamp life 2000 hours
- Short focus lens

Rent* \$15.24/wk

N9298 **\$1,360**

VT470GK

- 2000 ANSI lumens
- SVGA Resolution
- Compact 2.9kg
- Security functions
- Lamp life 2000 hours
- Auto keystone correction

Rent* \$20.73/wk

P6583 **\$1,850**

VT670GK

- 2100 ANSI lumens
- XGA Resolution
- Compact 2.9kg
- Security functions
- Auto keystone correction
- Lamp life 2000 hours
- Short focus lens

Rent* \$28.71/wk

P5886 **\$2,799**

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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PROJECTORS, OPTICAL STORAGE AND DIGITAL CAMERAS

5.1 MEGAPIXEL

DSCP93



- 3x Optical Zoom
- 6x Digital Zoom
- 1.5" Colour LCD
- ISO Sensitivity Settings: Auto, 100, 200, 400
- MPEG Movie VX with audio

N3672

\$499

5.1 MEGAPIXEL

DSCP100S



- 3x Optical Zoom
- 6x Digital Zoom
- Carl Zeiss Lens
- 1.8" Colour LCD
- RIMP - Real Imaging Processor
- MPEG Movie VX with audio

Rent* \$6.26/wk

N5196

\$559

All Cybershot cameras feature PictBridge for direct printing to a printer and are supplied with a Memory Stick, Battery, Charger, AV Cable, USB Cable & Software for digital imaging on a PC.

*RENTSMART

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DUAL LAYER DVD BURNER



INTERNAL IDE

- 16x Max SL +/-R DVD Recording
- 4X +R Dual Layer Recording
- 48 x Max CD Recording
- 24x Max CD Rewriting
- 16x Max DVD Playback
- Additional black faceplate supplied

EXTENSIVE SOFTWARE SUITE:

- Nero Burning ROM SE/Express - DVD & CD Mastering
- InCD - drag-n-drop file copying
- Nero BackItUp - PC file backup
- Nero Vision Express - Video Editing & Movie Authoring
- Nero Showtime - Movie Playback

R5778

\$149

VPLES2 LCD DATA PROJECTOR



- 1500 ANSI Lumens
- SVGA Resolution
- Ultra long lamp life of up to 4,000 hours

With its superb quality and flexibility, the VPLES2 is ideal for the modern lifestyle. Designed to impress, it offers powerful multimedia projection capabilities for an exceptional large screen viewing experience. Use it to play your favourite home movies, or to deliver a polished business presentation for a professional impact in the office.

Rent* \$20.72/wk

Q9803

\$1,849



EXTERNAL USB 2.0 AND FIRE WIRE

- 16x Max SL +R DVD Recording
- 8x Max SL -R DVD Recording
- +R Dual Layer Recording
- 48 x Max CD Recording
- 24x Max CD Rewriting
- 16x Max DVD Playback

- Nero MediaPlayer & WaveEditor - audio editing
- Nero Cover Designer - Disk label creation
- Nero Tool Kit - Disk utility
- Easy install guide
- Interactive user manual

Q2610

\$289

VPLCX75 LCD DATA PROJECTOR



- 2500 ANSI Lumens
- XGA Resolution
- Short Focus Lens
- Air Shot Wireless Presentations
- Memory Stick Slot

The VPLCX75 is the latest ultra compact projector from Sony, delivering 2500 ANSI lumens with XGA resolution for outstanding image quality, even in bright rooms. Advanced Intelligent Auto Setup allows presentations to be started immediately. As soon as the power is turned on, the projector initiates a host of sophisticated set-up functions, including auto-focus.

Rent* \$42.64/wk

P4290

\$4,325

HP DIGITAL PROJECTORS

SB21 DIGITAL PROJECTOR

- DLP™ technology
- 1000 lumens in brightness
- High 1800:1 contrast ratio
- Extremely portable at 1kg
- Carry bag included
- 2 years (unit exchange) warranty

BONUS!

See side bar
and below
for details^A



Rent* \$23.52/wk

\$2,099

G8845

MP3222 DIGITAL PROJECTOR

- DLP™ technology
- 2000 lumens in brightness
- High 2000:1 contrast ratio
- Integrated speaker
- 1.7kg
- Carry bag included
- 3 years (unit exchange) warranty

BONUS!

See side bar
and below
for details^A



Rent* \$29.74/wk

\$2,899

P7947

MP3130 DIGITAL PROJECTOR

- DLP™ technology
- 1800 peak ANSI lumens in brightness
- 1800:1 contrast ratio
- 16.7 million colour
- Integrated speaker
- True XGA (1024 x 768) resolution with VGA to SXGA+ scaling

BONUS!

See side bar
and below
for details^A



Rent* \$38.44/wk

\$3,899

L3520

Information regarding DLP™ technology provided by Texas Instruments from research conducted by the Munsell Colour Science Laboratory (MCSL) at the Rochester Institute of Technology.

^A **Terms and Conditions:** A limit of 3 claims per individual or business. Not available in conjunction with any other HP offer. Claims must be in by May 7th 2005. Visit www.hp.com.au/projectors for more informations and link to download a copy of the redemption form.

BONUS OFFER:

Purchase a HP projector (Part No's G8845, P7947 or L3520) from Harris Technology between 01/04/05 - 30/04/05 and you will be entitled to receive ONE of the following options via redemption direct from HP.

OPTION 1:

HP R707 DIGITAL CAMERA WITH INSTANT SHARE

- 5 megapixel
- 3x optical
- 8x digital zoom
- 1.5" LCD screen



OR

OPTION 2:

HP MOBILE 60" PROJECTOR SCREEN

Take your work presentation or movie experience anywhere.



OR

OPTION 3:

IPOD MINI

Keep up to 1,000 songs in your pocket.



*RENTSMART

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HP PRINTERS

HP DESIGNJET 130NR PRINTER



Perfect for printing large posters
A2 (C-size) tray and automatic
roll-feed capability up to 625mm (24
inches). Print postcard-size images,
full-colour pages, or banner-style.

Rent* \$41.40/wk

N7170

\$4,199

UPGRADE TO 3YRS NEXT-DAY
EXCHANGE CARE PACK

J3685

\$649

Order a free print sample at
www.hp.com.au/freeprint

HP BUSINESS INKJET PRINTER
1200D
\$50
CASHBACK*
1200D

- Up to 28ppm black & up to 8ppm colour in fast mode
- Up to 1200 x 1200 dpi black & 4800 x 1200 optimised dpi colour
- 32MB RAM
- Automatic two sided printing

HP BUSINESS INKJET 1200d

P9268 \$50 Cashback* **\$349**

HP BUSINESS INKJET 1200dtn

P9274 **\$529**

*Available for redemption from HP.
See www.hp.com.au/promotions
for details.

*RENTSMART

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conditions apply.

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available for pick-up/delivery.

HP OFFICEJET 9130
ALL-IN-ONE
\$100
CASHBACK*

PRINTS, SCANS, COPIES, & FAXES

- Workgroup color all-in-one that prints, scans, copies, & faxes.
- 25ppm black & 22ppm color printing & copying
- 2400x2400 optical flat-bed scanning
- Fax at 33.3kbps.
- Ships with a duplexer, 250 sheet 2nd tray, keyboard & a Jetdirect 620n network card.

Rent* \$15.68/wk

L8054 HP OJ 9130

\$1,399HP COLOR LASERJET
2550 SERIES
\$150
CASHBACK*
LJ 2550L

- Up to 19ppm A4 mono and up to 4ppm A4 colour
- 64MB built-in SDRAM
- 600 x 600 dpi with HP ImageREt 2400
- 30,000 pages per month

Rent* \$8.95/wk

N5947 HP Color LJ 2550L*

\$799

Rent* \$11.87/wk

N6031 HP Color LJ 2550LN

\$1,059

Rent* \$15.34/wk

N6032 HP Color LJ 2550N

\$1,369HP COLOR LASERJET
4650 SERIES

- Up to 21ppm colour and black & white
- 160MB RAM
- 600 x 600 dpi with HP ImageREt 3600
- 100 sheet multipurpose tray and 500 sheet input tray
- 533 MHz RISC processor
- 85,000 pages per month

Rent* \$33.14/wk

N5949 HP Color LJ 4650

\$3,339

Rent* \$39.32/wk

N6043 HP Color LJ 4650DN

\$3,988

Rent* \$50.47/wk

N6044 HP Color LJ 4650DTN

\$5,469HP COLOR LASERJET
3550 SERIES

- Up to 16ppm colour and black & white
- 600 x 600 dpi with HP ImageREt 3600
- 64MB RAM
- 533 MHz RISC processor
- 45,000 pages per month

Rent* \$19.04/wk

Q3133 HP Color LJ 3550

\$1,699

Rent* \$23.03/wk

Q3134 HP Color LJ 3550N

\$2,055

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE



harristechnology



Printers

MONO LASERJET PRINTER SERIES

HP LASERJET 1320 SERIES



Fast desktop laser printer ideal for small business workgroup or SOHO users

- Prints up to 21ppm in A4
- Resolution: 1200 dpi
- First page out: 8.5 seconds
- 16MB RAM
- 133MHz Processor
- Interface: USB 2.0 port, IEEE 1284-B compliant parallel port

Rent* \$8.17/wk

P9319 HP LJ 1320 **\$729**

Rent* \$10.07/wk

P9320 HP LJ 1320N **\$899**

Rent* \$12.20/wk

P9321 HP LJ 1320TN **\$1,089**

HP LASERJET 2430 SERIES



- Prints up to 33ppm
- 1200dpi RET & FastRes 1200 dpi
- 64MB RAM, expandable to 320MB
- 400MHz processor

Rent* \$24.18/wk

Q2892 HP LJ 2430TN **\$2,158**

Rent* \$23.67/wk

Q2893 HP LJ 2430DTN **\$2,289**

HP LASERJET 4345MFP SERIES



**IDEAL FOR SMB
PRINTER, SCANNER, COPIER**

Print: Up to 43ppm in A4

- First page out: 10 seconds.
- Resolution: 1200 dpi
- Easy to use touch screen control panel

Scan: Up to 45cpm (letter)/43cpm (A4)

Copy: Resolution enhanced 600 x 600 dpi

HP LJ 4345MPF Rent* \$39.03/wk

R0332 **\$3,959**

HP LASERJET 4250 SERIES



- Up to 43ppm in A4
- Resolution: 1200 dpi
- 500 sheet tray & 100 sheet multi-purpose tray
- Monochrome laser
- Two open industry-standard CompactFlash slots

HP LJ 4250 Rent* \$18.77/wk

Q3919 **\$1,675**

HP LJ 4250N Rent* \$23.67/wk

Q2900 **\$2,289**

HP LJ 4250TN Rent* \$27.91/wk

Q2894 **\$2,699**

HP LJ 4250DTN Rent* \$32.81/wk

Q2890 **\$3,199**

*RENTSMART

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HP LASERJET ALL-IN-ONES FOR OFFICE PRINTING

LASER PRINT, PC FAX, LASER FAX, SCAN & DIGITAL COPY

- No waiting time (first page out as fast as 8s for LJ 3380)
- Print resolution: 1200 dpi effective output

LASERJET 3015 ALL-IN-ONE



**\$50
CASHBACK***

Print: 15/14ppm (letter/A4), 32MB RAM
Copy: 15/14 cpm
Scan: 600 x 600 dpi optical resolution (9600 dpi enhanced), colour scanning
Fax: 33.6kbps

M7636 **\$429**

LASERJET 3030 ALL-IN-ONE



**\$100
CASHBACK***

Print: 15/14ppm (letter/A4), 32MB RAM
Copy: 15/14 cpm
Scan: 600 x 600 dpi optical resolution (9600 dpi enhanced), colour scanning
Fax: 33.6kbps

M7638 Rent* \$7.83/wk **\$699**

LASERJET 3380 ALL-IN-ONE



**\$100
CASHBACK***

Print: 20/19ppm (letter/A4), 32MB RAM (expandable to 96MB)
Copy: 20/19 cpm
Scan: 600 x 600 dpi optical resolution (9600 dpi enhanced)
Fax: 33.6kbps

M7639 Rent* \$10.86/wk **\$969**

*Available for redemption from HP. See page 40 for details or visit www.hp.com.au/promotions full terms & conditions.

HP DESKJET & OFFICEJET SERIES

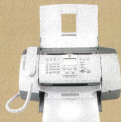
HP PSC 1315



- **Print:** up to 17ppm black, 12ppm colour, Up to 4800 x 1200 optimised dpi
- **Scan:** up to 600 x 2400 dpi
- **Copy:** 600 dpi mono, up to 1200 x 1200 dpi colour

P7035 **\$131**

HP DESKJET 4255 ALL-IN-ONE



Ultra compact all-in-one • print, fax, scan, copy and phone in one small machine

- Up to 17ppm in black, up to 1200 x 1200 dpi
- Up to 12ppm in colour, up to 4800 x 1200 optimised dpi colour & 1200-input dpi
- Scan Quality up to 36-bit colour
- Fax Transmission 33.6 Kbps

N8513 **\$199**

CASHBACK PROMO

^ Available for redemption from HP on products purchased between 01/03/05 and 31/05/05. See www.hp.com.au/promotions for claim form and full terms and conditions.

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HP PSC 1610



- **Print:** up to 23ppm black, 19ppm colour up to 4800 x 1200 optimised dpi
- **Scan:** up to 1200 x 1400 dpi
- **Copy:** 600 dpi mono, up to 1200 x 4800 dpi colour
- View, edit and print photos with or without a PC with PictBridge port
- Digital media card slots

HP OFFICEJET 2355 ALL-IN-ONE



- **Print:** up to 23ppm black, 18ppm colour
- Up to 4800 optimised dpi
- **Scan:** up to 1200 x 4800 optical resolution, 48-bit colour
- **Copy:** up to 23ppm black, 18ppm colour
- Borderless A4 photo printing
- View, edit and print photos with or without a PC
- Front PictBridge port and digital media card slots

HP OFFICEJET 2710 ALL-IN-ONE



- **Print:** 30ppm black, 20ppm colour
- Up to 4800 optimised dpi
- **Fax:** 33.6kbps fax modem
- **Scan:** up to 2400 x 4800 optical resolution, 48-bit colour
- **Copy:** up to 30ppm black, 20ppm colour
- Borderless A4 photo printing
- Wired ethernet and wireless 802.11g networking built-in

R5058 **\$235**Q2901 **\$325**Q2903 **\$629**

Rent* \$7.05/wk

HP OFFICEJET 6210 ALL-IN-ONE



- **Print:** up to 23ppm black, 18ppm colour
- **Fax:** 33.6kbps fax modem
- **Scan:** 1200 x 2400 optical resolution, 48-bit colour
- **Copy:** 23ppm black, 18ppm colour
- PictBridge
- Ethernet optional

HP OFFICEJET 7210 ALL-IN-ONE



- **Print:** up to 30ppm black, 20ppm colour
- **Fax:** 33.6kbps fax modem
- **Scan:** up to 2400 x 4800 optical resolution, 48-bit colour
- **Copy:** 30ppm black, 20ppm colour
- Ethernet
- 50 page ADF
- 8 types of memory card support + PictBridge

R5060 **\$419**R5061 **\$559**

Rent* \$6.26/wk



harris technology



Printers

THE VALUE FRONTIER



R3899

FS-920

- Up to 18ppm A4
- Power PC 405 266MHz
- 600 x 600 dpi
- 32MB/288MB
- 11 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 250 sheet input cassette
- Parallel + USB 2.0
- 15,000 pages per month maximum duty cycle
- Return to base or KyoCare Exchange, 1 year or 100,000 pages whichever occurs first

\$425

N2191

FS-1020D

- Up to 20ppm A4
- Power PC 405 266MHz
- 600 x 600 dpi
- 16MB RAM (Max: 272MB)
- 10 seconds to print first page
- A4, B5, letter, legal paper sizes
- 50 + 250 sheet input
- Parallel + full speed USB 2.0
- 15,000 pages per month maximum duty cycle
- Standard automatic duplex unit
- 2 year return to base warranty

Rent* \$6.71/wk

\$599

N2002

FS-1920

- Up to 28ppm A4
- Power PC 405 266MHz
- 600 x 600 dpi
- 32MB RAM (Max: 288MB)
- 9.5 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 100 + 500 sheet input
- Parallel + full speed USB 2.0
- 125,000 pages per month maximum duty cycle
- 2 year on-site warranty

Rent* \$15.68/wk

\$1,399

N6150

FS-3830N

- Up to 33ppm A4
- PC 750 CX/300MHz
- 600 x 600 dpi
- 96MB RAM (Max: 576MB)
- 11.5 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 100 + 500 sheet input
- Fast Ethernet 10/100 Base TX + Parallel + Hi-speed USB 2.0
- 175,000 pages per month maximum duty cycle
- 2 year on-site warranty

Rent* \$14.22/wk

\$1,819

L5843

FS-C5016N

- Up to 16ppm A4
- Power PC 750 CXe/400MHz
- 600 x 600 dpi
- 96MB RAM (Max: 608MB)
- 16 seconds to print first page
- A4, B5, A5, letter, legal paper sizes
- 100 + 500 Sheet input
- Network + Parallel + Full Speed USB 2.0
- 85,000 pages per month maximum duty cycle
- 2 year on-site warranty

Rent* \$32.89/wk

\$3,207KYOCERA FS-1000/FS1010 -
TONER KIT

A4532

\$135KYOCERA FS-3830N TONER
20,000 YIELD

N6559

\$175KYOCERA FS-1920 TK-55
TONER 15,000 PAGE YIELD

N2204

\$165KYOCERA FS-C5016N BLACK
TONER 8000 PAGES

L5849

\$115KYOCERA FS-C5016N CYAN
TONER 8000 PAGES

L5850

\$218KYOCERA FS-C5016N
MAGENTA TONER 8000 PAGES

L5851

\$218KYOCERA FS-C5016N YELLOW
TONER 8000 PAGES

L5852

\$218KYOCERA FS-C5016N COLOUR
KIT WITH BONUS BLACK
TONER

L5853

\$635

*RENTSMART

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CHECK OUT LEXMARK'S WEBSITE FOR THEIR LATEST PROMOTIONS

LEXMARK
TONER

LEXMARK E SERIES

Lexmark E Series 2,500 page toner cartridge. Suits Lexmark E230, E232, E330 & E323n laser printers.

P2866 **\$115**LEXMARK X215
3,200 PAGE TONER CARTRIDGEL5690 **\$105**LEXMARK C510
SERIES

C510 High Yield Cyan Cartridge

N5852 **\$255**

C510 High Yield Magenta Cartridge

N5853 **\$255**

C510 High Yield Yellow Cartridge

N5854 **\$255**

C510 High Yield Black Cartridge

N5855 **\$179**

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LEXMARK P6250
ADVANCED FEATURES,
SIMPLE PHOTO PRINTING

- Up to 22ppm mono, up to 15ppm colour
- 4800 x 1200 dpi, borderless prints
- Full colour 2.5 inch LCD screen
- Print directly from your digital camera
- Easily enhance, print & manage digital photos using the Exclusive Lexmark Imaging Studio Software
- Scan to email or print: 48-bit CIS flatbed colour scanner

Q5740 **\$329**LEXMARK C510
HIGH QUALITY DESKTOP
PRINTER FOR ALL YOUR
COLOUR & MONO PRINTING

- 30ppm mono & 8ppm colour laser
- 64MB expandable to 320MB
- 500MHz processor
- 2400 image quality resolution
- PostScript 3 & PCL6 emulation
- 250-sheet input expandable to 780-sheets
- USB & parallel ports standard
- 2 years next business day onsite warranty
- Put it on your network N4000e - M2857

\$265

Rent*\$8.95/wk

N2015 **\$799**LEXMARK E230
AN EXCELLENT EVERY DAY
PRINTER

- Outstanding performance in a desktop laser
- 17ppm A4 mono laser printer
- 100MHz processor and 8MB standard
- PCL6 emulation
- In-built 250-sheet paper drawer
- USB & parallel ports standard
- 1 year onsite exchange LexExpress warranty

Q2332 **\$199**LEXMARK T430D
PRODUCTIVITY FOR SMALL
WORKGROUPS!

- 30ppm and first print in 8sec
- Standard with automatic duplex for paper saving
- Up to three input sources for different office media
- Easily replaceable, high yield toner cartridge
- 2 years next business day onsite warranty
- T430dn: Integrated 10/100BaseTx standard

Rent*\$14.56/wk

R6349 T430D **\$1,299**

Rent*\$17.92/wk

R6350 T430DN **\$1,599**LEXMARK X215
THE AFFORDABLE LASER
MULTIFUNCTION SOLUTION

- Printer - 16ppm A4 laser printer & copier
- Copier - including 30-sheet ADF (or flatbed)
- Scanner - colour scan to PC (TWAIN)
- Fax - 33.6Kbps (Super G3) fax modem
- 250 sheet input drawer
- USB & parallel ports standard
- 1 year LexExpress warranty

L4391 **\$399**LEXMARK X422
SMALL WORKGROUP MFP
SOLUTION - FAST &
AFFORDABLE!

- Compact and space-saving MFP for small workgroups
- Print, copy, fax and scan in 1 device
- Print / copy up to 22ppm A4
- Colour network scanning
- 50-sheet automatic document feeder
- Easily replaceable, high yield toner cartridge
- 2 years next business day onsite warranty

Rent*\$21.28/wk

R6289 **\$1,899**

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE

SAMSUNG

harristechnology



Printers

QUALITY AND INNOVATION, NO RISK



MONO LASER PRINTER

SAMSUNG ML-2250

- Prints up to 20ppm in A4 at max. resolution of 1200 dpi
- Time-to-first-print - 10 seconds
- Comes complete with a 250 sheet paper cassette, plus a 50 sheet multipurpose feeder
- USB 2.0 and Parallel Connection
- PCL-6 driver
- Elegant ceramic gloss finish

Q1969

\$379



COLOUR LASER PRINTER

SAMSUNG CLP-500

- 5ppm colour, 20ppm mono
- Standard auto-duplexing
- Quiet - a colour laser as quiet as a mono!
- Comes with a 250 sheet paper cassette and 100 sheet paper feeder
- Connectivity USB 2.0 (USB 1.1 Compatible)
- Windows compatible
- 3 year manufacturer on-site warranty Australia wide

Rent* \$7.49/wk

M0876

\$669



MONO LASER PRINTER

SAMSUNG ML-2551N

- 3 year manufacturer onsite warranty
- Speed(A4): 24ppm
- Resolution: 1200 dpi max
- Processor: Samsung 266 MHz
- RAM (Std): 32 MB
- Monthly Duty Cycle: 100,000 pages
- Standard Internet & USB 2.0 interface
- 3 year manufacturer on-site warranty Australia wide

Rent* \$10.97/wk

M4990

\$979



COPY PRINT SCAN

SAMSUNG SCX-4100 MFP

- 14ppm mono laser all-in-one (Windows only)
- Copy, print and scan
- Colour scanner
- OCR software suite included
- Ships with 3,000 page toner

P7795

\$289

SAMSUNG TONER

SAMSUNG ML 2150/2151N/
2551N - 8,000 PAGE TONER
CARTRIDGE

N1521

\$195

SAMSUNG ML 2551N - 10,000
PAGE TONER CARTRIDGE

L7764

\$235

SAMSUNG ML-2250
5000 PAGE TONER CARTRIDGE

Q2002

\$145

SAMSUNG CLP-500
BLACK
TONER 7000 PAGE YIELD

M9755

\$139

SAMSUNG CLP-500
CYAN
TONER 5000 PAGE YIELD

M9756

\$155

SAMSUNG CLP-500
MAGENTA
TONER 5000 PAGE YIELD

M9757

\$155

SAMSUNG CLP-500
YELLOW
TONER 5000 PAGE YIELD

M9758

\$155

*RENTSMART

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EPSON®


**ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE**

EPSON PRINTERS

EPSON
PICTUREMATETHE EASY TO USE PERSONAL
PHOTO LAB FOR THE HOME
USER

Epson makes creating photos from your digital camera simple, cost effective and convenient. With the Epson PictureMate, creating lab-quality, highly durable, glossy photos has never been easier. And for less than 50 cents per photo, creating photos at home has never been more affordable!

- Lab quality 100 x 150mm border free photos without the need for a computer
- Prints at less than 50c per photo!
- Support for most available digital camera memory cards (Compact Flash, Smart Media (Max 128MB), Memory Stick, Magic Gate Memory Stick PRO, Memory Stick Duo, Microdrive, SD Memory Card, Mini SD Card, MultiMedia Card, xD Picture Card)
- Epson UltraChrome ink - featuring new red and blue ink for brighter photos
- Print photos directly from your PictBridge compatible digital camera
- Print directly from Bluetooth compatible mobile camera phones with the optional Bluetooth adaptor

P1646

\$359

RENTSMART

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COLOUR LASER



EPSON AL C3000N

High speed printing at 24 pages-per-minute in both colour and monochrome

- Up to 24ppm in full-colour
- Resolution: 600 dpi (2400 dpi with Epson RIT)
- Integrated 10/100 Base TX Network Interface
- Duplexing: Standard
- 600 page input standard

Rent* \$22.40/wk

Q7725

\$1,999

COLOUR LASER



EPSON AL C4100

- Up to 24ppm in full-colour
- 2400 dpi with Epson RIT
- Integrated 10/100 Base TX Network Interface
- Integrated Duplex Unit for two-sided printing!
- 600 page input standard

Rent* \$33.84/wk

L5869

\$2,999

STYLUS INKJET MULTIFUNCTION



EPSON CX6500

- Print up to 22ppm black
- 5760 x 1440 optimised dpi using RPM technology
- Epson DURABrite INK - for highly durable, water and smudge resistant prints
- Print BorderFree up to A4 prints
- Standalone colour copier
- Flatbed colour image scanner

P5731

\$345

COLOUR LASER



EPSON AL C1100

The Epson AcuLaser C1100 is the affordable colour and monochrome laser printer that delivers high speed, photo quality prints for small businesses and workgroups that require a compact and easy-to-use solution. The AcuLaser C1100 features the latest in EPSON's toner technologies - AcuBrite - and a new Wrap Transfer system to produce outstanding results first time, every time.

Rent* \$8.28/wk

Q7367

\$739

STYLUS MULTI FUNCTION



EPSON PHOTO RX630

- Up to 17ppm for black text A4 (memo)
- 5760 x 1440 optimised DPI (using RPM Technology).
- BorderFree printing up to A4
- Individual ink cartridge one for each of 6 colours
- Standalone colour copier functionality without a computer.
- High resolution 2400 x 4800 dpi scanner featuring colour restoration software
- Prints from digital memory cards, direct from PictBridge cameras and direct from USB memory devices

Q5675

\$525

PHOTO SCANNER



EPSON PERFECTION 4990

- 4800 x 9600 dpi optical resolution
- High Optical Density
- Windows and Macintosh Drivers
- High Speed - new moving carriage-type TPU, new lamps, faster film scanning (negative film)
- Productive - simultaneous scan of up to 24 35mm strip frames
- The ideal scanner for professional film scanning with DIGITAL ICE dust and scratch removal for film and prints

Rent* \$8.84/wk

R2909

\$789



KONICA MINOLTA

harristechnology



Printers

THE FUTURE IN IMAGING



KONICA MINOLTA PAGEPRO 1300W

RELIABLE PRINTING SOLUTION FOR USERS NEEDING TO PRINT
A MULTITUDE OF PROFESSIONAL BUSINESS DOCUMENTS
EFFICIENTLY

- Up to 16ppm A4
- 1200 x 1200 dpi FineART™
- First page Less than 13 seconds
- IEEE 1284 parallel
- Compatibility: Windows 98SE/ME/2000/XP

L6049

\$235



KONICA MINOLTA MAGICOLOR® 2400W DESKTOP COLOUR LASER PRINTER

Fast, small, light and easy to operate, this printer is a welcome addition to any team. The Magicolor 2400W is a cost effective colour printer that does not require special paper, unlike inkjets.

- 5ppm colour
- 20ppm black and white
- 2400 x 600 dpi,
- USB
- Windows Print System

Rent* \$7.83/wk

Q8208

\$699



KONICA MINOLTA MAGICOLOR® 5440DL THE IDEAL WORKGROUP COLOUR LASER PRINTER

The Magicolor® 3300 enables businesses to produce premium quality colour reports, presentations, spreadsheets and brochures with quality, speed and reliability they can depend upon.

- 25ppm colour / 25 ppm monochrome
- Up to 2400 x 600 dpi resolution
- Ethernet (10/100BaseTX) & hi-speed USB 2.0 interfaces
- Windows Server 2003/XP/2000/NT4/98SE, Macintosh OSX v10.2+ compatible & Linux

Rent* \$24.64/wk

R4299

\$2,199



KONICA MINOLTA MAGICOLOR® 5430DL COLOUR LASER PRINTER

With crisp and fast output, the Magicolor 5430 is the most innovative laser printer in its class. With over 30 brand new features, it is sure to impress any workgroup.

- 20ppm A4 colour or mono
- 64MB RAM
- 2400 x 600 dpi resolution
- A4, letter, legal page sizes
- USB, parallel and network interfaces
- First page print time 14.1 secs.
- GDI printing

Rent* \$19.71/wk

P8495

\$1,759

KONICA MINOLTA MAGICOLOR® 2430DL CONNECT YOUR DIGITAL CAMERA DIRECTLY TO THIS PRINTER



- Personal colour laser printer
- Up to 20 ppm b&w, 5 ppm colour
- 10/100BaseTX Ethernet® & USB 2.0 (high Speed) interfaces
- 2400 x 600 dpi resolution
- 200-sheets input standard /700-sheets input maximum
- Direct Photo print
- Windows® & Macintosh® compatible

Rent* \$9.51/wk

R4297

\$839

KONICA MINOLTA MAGICOLOR TONER CARTRIDGES 3300 TONER CARTRIDGE- BLACK N5137 **\$79**

2400W TONER CARTRIDGE BLACK, 4.5K YIELD R0703 **\$128**

2400W TONER CARTRIDGE MAGENTA, 4.5K YIELD R0706 **\$189**

2400W TONER CARTRIDGE YELLOW, 4.5K YIELD R0704 **\$189**

2400W TONER CARTRIDGE CYAN, 4.5K YIELD R0707 **\$189**

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

Canon

advanced simplicity

DIGITAL STILL CAMERAS

DV RANGE

MV800 SERIES

Big zoom, simple operation.
Real Widescreen. The perfect
introduction to video



MV800i
Model



NEW!

The powerful Canon zoom lens is ideal for recording even distant subjects. The stylish and compact design offers simple operation and with a high resolution 800k pixel CCD plus DiGiC DV signal processing it offers breathtaking image quality, even when viewing on a widescreen TV.

MV800i

- 20x zoom lens
- 800K CCD
- DiGiC DV
- Image stabilizer
- Real Widescreen

Rent* \$8.61/wk
\$769

R7074

MV830i

- 20x zoom lens
- 8MB SD card
- USB Interface
- Complete software bundle
- Real Widescreen

Rent* \$9.74/wk
\$869

R7075

MV850i

- 22x zoom lens
- Wide Attachment WA-28
- Super night mode
- Built-in LED light
- Real Widescreen

Rent* \$10.81/wk
\$965

R7076

*RENTSMART

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CANON POWERSHOT A510 & A520

A510



NEW!

A520



NEW!

Boasting powerful Canon 4x optical zoom lenses and Canon's intuitive DiGiC processor, the 4.0MP PowerShot A520 and 3.2MP PowerShot A510 deliver simply better pictures. Capture it all, from family photos to travel snaps with a total of 20 precise shooting modes. And best of all, these compact cameras are easy to use, simply point and shoot. Thanks to the Canon Print/Share[^] Button, true to life photo prints straight from the camera are a snap. Packed with features within a compact body, the PowerShot A510 and PowerShot A520 make it easy to take digital photography further.

- 4.0 Megapixel PowerShot A520 and 3.2 Megapixel PowerShot A510
- Canon 4x optical zoom lens.
- Movie recording and playback with sound.
- DiGiC Imaging Processor delivers superior digital photos.
- Print/Share[^] Button allows easy 'one push' printing of images straight from the camera.

R7274 A510

\$389

R7276 A520

\$489

CANON DIGITAL IXUS 700

R7279



NEW
Pre-order your
IXUS 700
for mid April
pick-up or
delivery

The 7.1 Megapixel Digital IXUS 700 delivers a sophisticated combination of cutting edge technology and flawless style. The fully retractable Canon 3x optical zoom lens delivers sharp, high resolution images while an extensive selection of shooting modes lets you precisely capture any situation. Capture all the detail with the DiGiC II processor delivering fast performance and industry leading image quality. Thanks to the Canon Print/Share[^] Button, true to life photo prints straight from the camera are a snap, while a huge 2 inch LCD monitor is perfect for reviewing photos and movie clips.

- 7.1 Megapixel.
- Canon 3x optical zoom lens.
- 60fps movie recording and playback with sound.
- Super fast DiGiC II Imaging Processor.
- Print/Share[^] Button allows easy 'one push' printing of images straight from the camera..

Rent* \$9.29/wk

R7279 IXUS 700

\$829

*Compatible printer required for Direct Printing. Compatible Windows computer required for direct download.

ALL PRINTERS
SUPPLIED WITH
BONUS
PRINTER CABLE

Canon
advanced simplicity

harristechnology



Printers & Faxes

ADVANCED SIMPLICITY

THE COMPLETE ALL-IN-ONE PHOTO SOLUTION. OUTSTANDING PRINTS, COPIES AND SCANS.



NEW!

PIXMA MP760

- All colour functions: Printer, Copier and Scanner
- 2 picolitre FINE (Full-photolithography Inkjet Nozzle Engineering) print-head technology
- ContrastPLUS 5-colour individual ink system
- Print and copy up to 25ppm black and 17ppm colour
- Scan beautiful photos up to 2400 x 4800 dpi (9600 dpi optimised)
- Built in Film Adaptor Unit (FAU) allows you to scan up to 6 negatives or 4 mounted slides
- Dual paper path with Auto Sheet Feeder
- Built-in automatic duplex unit for convenient double-sided printing
- Film Direct printing and direct photo printing from selected memory cards
- Prints directly onto printable CD-R & DVD-R media (Requires CD-R/DVD-R media with inkjet compatible printing surface)
- Features a large 2.5" LCD for easy viewing, editing and printing
- Complimentary software - Easy-PhotoPrint, CD-Label-Print, ScanSoft OmniPage SE & ArcSoft PhotoStudio

R7268

\$459

QUALITY PRINT, COPY, SCAN MADE SIMPLE



NEW!

PIXMA MP110 & MP130

- All-in-One - Print/Scan/Copy
- 2 picolitre FINE print-head technology results in sharp and enhanced detail for superb images
- Produce high-definition photos and documents at up to 4800 x 1200 dpi
- Print at up to 18ppm black and 13ppm colour
- Copy up to 16cpm black and 10cpm colour
- Scan high-definition prints at up to 1200 x 2400 dpi (9600 dpi optimised)
- Create true borderless 6" x 4", 5" x 7" and A4 size photos
- Comes with loads of software including Easy-PhotoPrint, Easy-WebPrint5, ArcSoft® PhotoStudio® and ScanSoft® OmniPage® SE

MP110



NEW!

MP130

R7284 MP110 PRINT, COPY, SCAN

\$169

R7290 MP130 PRINT, COPY, SCAN WITH DIRECT CARD PRINTING

\$189

CANOSCAN 8400F COLOUR FLATBED SCANNER



THE HIGH SPEED SCANNER WITH VERSATILE FEATURES

With USB 2.0 Hi-Speed interface, the CanoScan 8400F can capture reflective prints, 35mm negatives and slides as well as medium format film at quality 3200 dpi resolution. A host of additional features including convenient batch scanning of 12 frames of 35mm filmstrip, preview scans in 2.1 seconds and automatic retouching and enhancement (FARE level 3) technology making scanning easier.

KEY FEATURES:

- 3200 dpi Hyper CCD sensor with 48-bit colour depth
- Preview scans in only 2.1 seconds
- Verstep film scanning up to 12 frames of 35mm filmstrip, 4 x 35mm slides plus medium format film up to 6 x 22 cm
- Fast data transfer with USB 2.0 Hi-Speed interface
- Automatic dust, scratch, fading, graininess and backlight correction technology (FARE Level 3) for film scanning

Q3558

\$469

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PRINTERS & SOFTWARE

BROTHER - MULTI-FUNCTION CENTRES

At your side™
brother

BLACK INK CARTRIDGE

For MFC - 5840CN (500 Page yield)

R7294 **\$28**

CYAN INK CARTRIDGE

For MFC - 5840CN (500 Page yield)

R7295 **\$15**

MAGNETA INK CARTRIDGE

For MFC - 5840CN (500 Page yield)

R7296 **\$15**

YELLOW INK CARTRIDGE

For MFC - 5840CN (500 Page yield)

R7297 **\$15**



R0308

\$375



N9111 MFC-8440

\$785

N8094 MFC-8440D

\$999

MFC-5840CN

6-in-1 Colour Multi-Function Centre® Network Ready
Colour Document Centre with Super G3 Fax

- Prints up to 20ppm mono & up to 15ppm colour and copies up to 17ppm mono & up to 11ppm colour
- Up to 1,200 x 6,000 dpi optimised
- Fax modem: 33.6kbps
- Colour scanning up to 1,200 x 2,400dpi
- PhotoCapture Centre™
- USB 1.1 & 2.0 Full Speed connectivity as standard

MFC-8440

5-in-1 Laser Flatbed Multi-Function Centre® with super G3 fax fully featured laser document solution with built in duplex printing (duplex only on MFC-8440D)

- Print up to 20ppm (A4) and copies up to 20cpm (A4)
- Automatic Document Feeder and automatic duplex (MFC-8440D only)
- Fax modem: 33.6Kbps
- Colour scanning Up to 1,200 x 600dpi
- Parallel + full speed USB 2.0
- Optional 250 Sheet paper tray and Network Interface

Rent* \$8.79/wk

Rent* \$11.19/wk

12 MONTHS OF UPDATES AND UPGRADES - SECURITY YOU CAN TRUST....GUARANTEED

ZoneAlarm®



ZONEALARM PRO 5

- Stop hackers and cybercriminals
- Monitor inbound/outbound email activity
- Safeguard personal information

P9251 SINGLE USER **\$79**

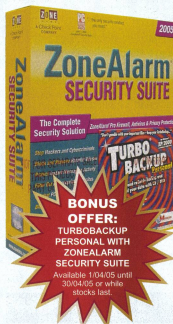
P9249 5 USER **\$299**

*RENTSMART

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ZONEALARM SECURITY SUITE

- **Award-Winning Firewall**
Easy-to-use firewall blocks hackers and other unknown threats. Stealth mode automatically makes your PC invisible to anyone on the Internet.
- **Comprehensive Antivirus Protection**
Stops viruses and worms, and protects against emerging viruses before they attack.
- **Powerful Identity & Privacy Protection**
Keeps personal data private and secure, deletes ad-ware cookies, blocks pop-up ads, and more.
- **Essential Email Security**
Quarantines suspicious email attachments and blocks outbound messages containing potential viruses.

TURBO BACKUP PERSONAL

TurboBackup Personal provides you with pre-defined templates to quickly and easily setup backups with just one click. It is packed full of features including user configurable file filtering to select only the files you want included.

- Backup and restore wizard - as easy as 1-2-3!
- Batch backup lets you perform multiple backups with one click
- Provides emergency restore, machine synchronisation
- Supports media spanning - automatically prompts for more CD / DVD when backup is larger than one disc
- Backup task management along with detailed backup information

Q6012

\$99

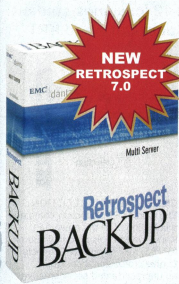
SOFTWARE

harris technology



Software

NEW EMC DANTZ RETROSPECT 7.0 FOR WINDOWS



Dantz® Retrospect® 7 for Windows provides complete protection for file servers, desktops, notebooks, and business-critical applications.

RETROSPECT PROFESSIONAL - Designed for home and small office users who want to protect a single Windows computer and up to two additional networked Windows or Macintosh desktops and notebooks by backing them up to a Windows-based computer.

RETROSPECT SINGLE SERVER - Designed for small or midsize businesses with a single server. Runs on Microsoft Windows, Macintosh and backs up and restores a single file server or business-critical application server, as well as desktops and notebooks running Windows, Macintosh and selected Unix-based operating systems.

RETROSPECT SMALL BUSINESS SERVER* - Backup and restore a single server running Windows Small Business Server, as well as networked desktops and notebooks running Windows, Macintosh, Linux Red Hat & Suse, and selected Unix based operating systems. Available in two editions- Premium edition and Standard edition. The Standard edition includes an Exchange agent and Disaster Recovery agent for the server while the Premium edition includes all the above plus the SQL Server agent.

RETROSPECT MULTI SERVER* - For small to midsize businesses with several Microsoft Windows servers. Backs up and restores computers running on Windows, Macintosh, and selected Unix operating systems.



- 4 New Wizards to have you backing up in minutes
- Accurate Restores
- Disk-to-Disk-to-Tape for faster backups
- Cross-platform support

ADD-ON PRODUCTS:

- EXCHANGE SERVER AGENT
- SQL SERVER AGENT
- ADVANCED TAPE SUPPORT
- OPEN FILE BACKUP
- DISASTER RECOVERY
- ADD-ON VALUE PACK

R4121

DANTZ RETROSPECT PROFESSIONAL 7.0

\$199

R4122

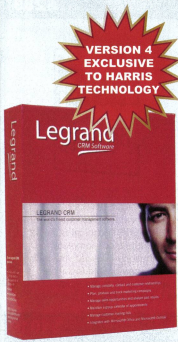
DANTZ RETROSPECT SINGLE SERVER 7.0

\$1,099

***CALL 1300 13 9999
FOR LATEST PRICING**

LEGRAND CRM SOFTWARE - VERSION 4

AUSTRALIA'S FINEST CUSTOMER DATABASE MANAGEMENT SOFTWARE



Legrand CRM is an Australian-developed, Customer Relationship Management (CRM) solution that is both powerful and easy to use. Powerful yet practical, functional yet affordable, Legrand CRM is the ideal customer database management solution for workgroups and small businesses. If you are determined to grow your customer base, strengthen your existing customer relationships and effectively manage your sales team then you need to look at Legrand CRM.

The centralised database is easily shared by all staff members in the office. All customer information is right at everyone's fingertips, thereby ensuring that everyone in the office is fully informed on all customer communications and activities. A robust data synchronisation routine enables laptop users to operate a local database which they can synchronise with the main data over the office LAN.

Legrand CRM is available in different Editions to meet your size and functionality. The optional accounting interfaces (purchased separately for use with Professional edition only) enable you to exchange information with several accounting systems, including selected Quickbooks and MYOB configurations.

STANDARD EDITION

Q0314

SINGLE USER

\$275

PROFESSIONAL EDITION

Q0318

SINGLE USER

\$469

Legrand
CRM Software

STANDARD EDITION

- Account & Contact management
- Mailing list management
- Mail merge using Microsoft Word
- Group Calendar & Tasks
- Microsoft Outlook interface
- Marketing Campaigns & Events
- Sales Opportunities
- User Login control
- No optional modules available

PROFESSIONAL EDITION

Standard edition features plus

- Enhanced User Rights
- Personalised Email
- 'Lapsed Customer' reporting
- Multi-value Quicksearch
- TAPI support

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CORELDRAW GRAPHIC SUITE 12 BUNDLE

COREL PAINTER™ IX



Corel® Painter™ IX - the world's most powerful Natural-Media® painting and illustration software - features unique digital brushes, art materials and textures that mirror the look and feel of their traditional counterparts. The newest version of Corel Painter takes digital design to unprecedented levels with the revolutionary Artists' Oils Painting System, Snap-to-Path Painting, Quick Clone for photographers, and brushes that perform up to ten times faster than previous versions. Corel Painter enables some of the world's most accomplished creative professionals - including commercial designers, artists, and photographers - to extend their natural talents and techniques to create original works of breathtaking digital art.

FULL
Q0500 **\$649**

UPGRADE / CROSSGRADE
Q0501 **\$355***

STUDENT & TEACHER EDITION
Q0502 **\$155***

*Full terms and conditions of upgrade/crossgrade are available online at corel.ht.com.au
▲Proof of valid student status (of the purchaser) must be provided in order to qualify for this pricing.

PLEASE NOTE:

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Purchase or upgrade to CorelDraw Graphics Suite 12 (excludes student and teacher edition) and receive a **BONUS** Corel KnockOut 2 and KPT Collection plug-in*



CORELDRAW GRAPHICS SUITE 12

Ideal for both professional graphic designers and business people, CorelDRAW® Graphics Suite 12 offers a comprehensive graphics solution. Featuring three industry-leading applications - CorelDRAW 12 for illustration and page layout, Corel PHOTO-PAINT® 12 for digital imaging and Corel R.A.V.E.™ 3 for motion graphics creation. This powerful suite delivers incredible ease of use and a wide range of graphics functionality.



COREL KNOCKOUT 2

Hair, smoke, shadows, water, transparencies and any blurred or out-of-focus edges can now be masked with incredible precision, speeding up the entire design process. Plus, Corel KnockOut 2 is an ideal plug-in for Adobe® Photoshop®, Corel PHOTO-PAINT® or Corel® Painter™ 8, so it fits seamlessly into your workflow.

*Includes CD media only (excludes manuals). Available only while stocks last. Offer excludes student and teacher edition.



COREL® KPT® COLLECTION

The Corel KPT Collection combines a selection of all the powerful Kai's Power Tools plug-in filters of KPT® 5, KPT® 6 and KPT® effects™ to give professional designers an unprecedented set of creative tools. A natural addition to Adobe® Photoshop®, it dramatically extends the boundaries of image editing, and makes a significant impact on your creativity and productivity.

Q3712

FULL VERSION

\$645

Q3711

UPGRADE/CROSSGRADE

\$285*

PAINT SHOP PRO 9

- **Photos:** Edit, enhance, and repair with precision tools.
- **Art:** Create masterpieces with realistic painting tools.
- **Graphics:** Design for presentations, print, or the Web.

Q3648

\$275

PAINT SHOP ALBUM 5

- Find photos in the blink of an eye
- Improve photos in an instant
- Have fun sharing photos
- Protect photos from computer crashes and viruses
- Includes Bonus PhotoRecovery Software, scrapbook templates, photo paper samples, and more.

R2118

\$89

COREL DESIGNER® TECHNICAL SUITE 12

Feature rich and affordable, Corel DESIGNER® Technical Suite 12 delivers the most complete combination of precise, powerful, industry-compatible technical graphics tools at the most competitive price.

R7854

\$1019

MACROMEDIA STUDIO MX 2004

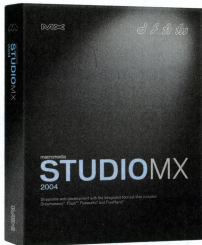
MACROMEDIA STUDIO MX 2004

Macromedia Studio MX 2004 integrates the leading professional tools for developing the full range of web sites and internet applications.

Studio MX 2004 provides professional functionality for every aspect of web development, all in one integrated package. Developers can build websites and applications with Dreamweaver, create interactive content with Flash, generate web graphics with Fireworks, and incorporate vector graphics with FreeHand. For developers delivering rich interactive applications, Studio MX 2004 is also available with Flash

MX Professional 2004.

Studio MX 2004 with Flash Professional includes everything in Studio MX 2004 plus the advanced capabilities of Flash MX Professional 2004.



K8904 STUDIO MX 2004 INCLUDING FLASH MX PROFESSIONAL 2004 WIN/MAC

\$1,489

K8903 STUDIO MX 2004 INCLUDING FLASH MX 2004

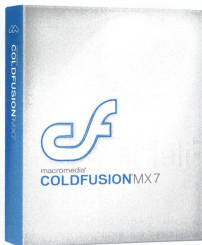
\$1,289

L1535 UPGRADE FROM STUDIO MX TO STUDIO MX 2004 INCLUDING FLASH 2004

\$660

TOP 10 REASONS TO UPGRADE TO MACROMEDIA® COLDFUSION MX 7

1. Generate structured business reports. Easily design and generate high-quality, repeating group, structured business reports and populate them dynamically in the context of web applications
2. Build rich, high-quality forms.
3. Create printable Web content.
4. Develop new classes of applications.
5. Develop faster with Dreamweaver MX 2004.
6. Achieve new levels of high availability.
7. Deploy on J2EE faster.
8. Protect source code investments.
9. Search with new power. Boost searching with the latest Verity technology.
10. Render rich charting. Produce clean, crisp charts and graphs with over 200 different modifiable attributes to control animation, colours, labels, and more. Include charts and graphs within dynamic business reports.



R5368 COLDFUSION MX STANDARD 7 2-CPU

\$1,520

R5375 COLDFUSION MX ENTERPRISE 7 2-CPU

\$7,299

MACROMEDIA® CAPTIVATE



Macromedia Captivate is the easiest way to create professional-quality, interactive simulations and software demonstrations in Macromedia Flash format. Without any programming or multimedia skills, automatically record onscreen actions, including editable mouse movements, text captions, and scored click boxes.

Macromedia Captivate (formerly RoboDemo) automatically records all onscreen actions and instantly creates an interactive Flash simulation. Point and click to add text captions, narration, and e-learning interactions without any programming knowledge.

Macromedia Captivate lets anyone record on-screen activity to create software simulations and product demonstrations. The result is an editable "show me" movie or demonstration complete with audio narration, animations, text captions, and highlights. Captivate can also instantly generate customisable software simulations with scored interactivity and instructional feedback.

Q5983 FULL

\$699

Q5984 UPGRADE[▲]

\$429

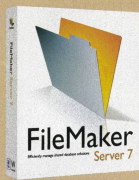
[▲]Upgrade from Robo Demo 5, Robo Demo E-Learning Edition 5, Robo Demo 4, Robo Demo E-Learning Edition 4

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EFFORTLESSLY MANAGES ALL YOUR INFORMATION

FILEMAKER SERVER 7



FileMaker Server 7 is high-performance server software that efficiently manages shared database solutions. With easy to use advances in sharing and administration, as well as enhanced security features.

N6744 FULL **\$1,650**
N9187 ACADEMIC* **\$875**

FILEMAKER MOBILE 7

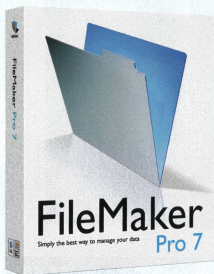


FileMaker Mobile 7 is a simplified version of FileMaker Pro, designed specifically for Palm OS and Pocket PC handhelds, so you can easily extend your FileMaker solutions beyond your desktop to mobile individuals and workgroups.

P3124 FULL **\$109**

PLEASE NOTE:

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FILEMAKER® PRO 7

FILEMAKER PRO 7 IS THE EASIEST-TO-USE, MOST-CUSTOMISABLE, VERSION OF FILEMAKER EVER.

FileMaker® Pro 7 database software is simply the fastest, easiest way to effortlessly manage, people, projects, images and information.

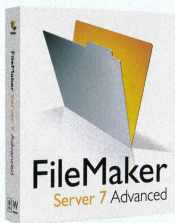
FileMaker® Pro 7 helps you organise, manage and share all of your data regardless of file type, so you can uncover critical business information and turn your ideas into productive, creative and customised solutions.

FEATURES INCLUDE

- Visual tool for managing relationships
- Multiple views in different windows
- Store any file type in FileMaker Pro 7
- Multiple tables per file
- Improved Instant Web Publishing
- New sophisticated security model

N0476 FULL **\$450**

N0477 UPGRADE **\$229**

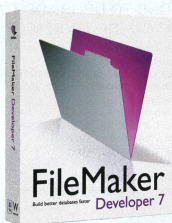
FILEMAKER SERVER 7
ADVANCED

FileMaker Server 7 Advanced is an enhanced version of FileMaker Server 7 that includes powerful web publishing and connectivity options to efficiently manage shared database solutions from desktop to the web.

P9697 FULL **\$4,199**

P9698 ACADEMIC* **\$2,195**

FILEMAKER DEVELOPER 7



FileMaker Developer 7 is an enhanced version of FileMaker Pro with integrated developer tools and utilities to help you build better databases faster.

N0478 FULL **\$835**

N1176 ACADEMIC* **\$429**

*Proof of valid student status (of the purchaser) must be provided in order to qualify for this pricing.

BUSINESS & PERSONAL FINANCE MADE QUICKEN EASY

QUICKEN SHARE ANALYSER V3

THE SMART WAY TO MANAGE YOUR TRADING STRATEGY

Scan the Market

Select a pre-set scan or create your own criteria (such as price or volume increases) to monitor the share market. Save time and search for the shares that you really want to invest in.

Chart the performance of selected shares

Gain a visual understanding of the performance of shares by using charts to plot the relationship between price and volume. You can compare the movement of certain shares against the All Ordinaries or ASX 200 indices, or against other shares in the same category.

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Includes first 12 months access to ASX All Share data

R0024

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QuickBooks Lite 2004 is for you if you need an accounting solution that covers the essentials.

- Fast and easy start up
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N4138

\$99

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QuickBooks Plus 2004 offers essential employee related accounting tools

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QuickBooks Point of Sale requires QuickBooks to run, so to complete your store solution choose from QuickBooks Pro 2004 or QuickBooks Premier 2004 and take advantage of QuickBooks Premier's retail specific edition.

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QuickBooks Pro lets you prepare quotes & estimates, integrates seamlessly with Microsoft Office and has advanced tools to help you increase efficiency and accuracy.

FULL^A

N4142

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FULL^A

N4147

\$1,299

UPGRADE

N4149

\$620

SUBSCRIPTION

N4151

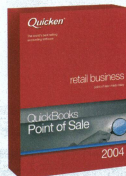
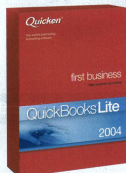
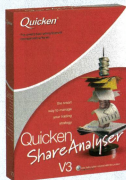
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BONUS UPGRADE

^APurchase QuickBooks 2004 Full version Products (part: N4139, N4142 or N4147) and register them between 01/04/05 - 30/04/05, and Quicken will send the 2005 Upgrade (free delivery) when it is released.

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P0577 FULL **\$159**

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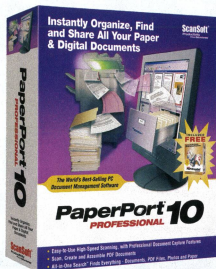
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Q3836

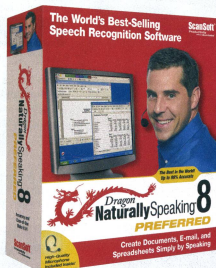
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Q3826

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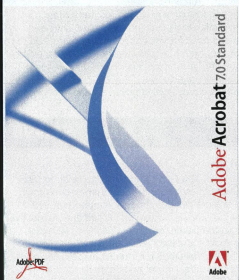
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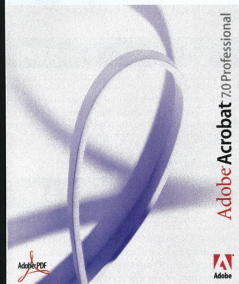
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Q7822

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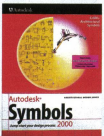
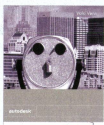
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*UPGRADE FROM LT2002/2004/2005

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P7266

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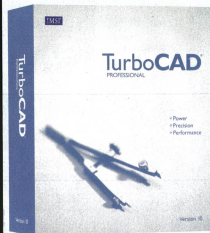
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N6151

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P2292

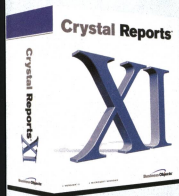
ACADEMIC*

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*Full Working version - No Student ID required.

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CRYSTAL REPORTS XI PROFESSIONAL



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CRYSTAL REPORTS XI PROFESSIONAL IS DESIGNED TO:

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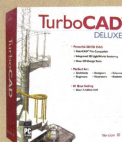
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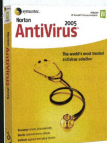
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Q0503 SINGLE USER **\$119**

Q0504 3 USER **\$185**

R1942 5 USER

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R0231 BUNDLE PRICE

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* Top-selling antivirus software product from December 2000 through March 2004 based on The NPD Group's retail Top Selling Business Software list.

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Norton Ghost 9.0 is developed with Drive Image™ Technology - this new technology allows users to take advantage of key features such as hot imaging, incremental backups, automatic backups and creating drive letters for images. Symantec's Norton Ghost 9.0 provides advanced backup and recovery for your PC. Protect your data by making a backup of your hard drive's contents—without restarting Windows®. Incremental backups save you time and disk space. You can even schedule backups to run automatically. Quickly restore individual files, selected folders, or the entire hard drive.

Q0030

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- Analyse what's selling, what's not and GST collected
- Manage Lay-bys and process refunds

R5316

\$809

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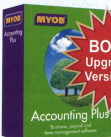
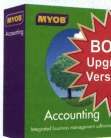
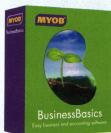
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N8884

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G4153

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N4713

FULL

\$469

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UPGRADE

\$259

MYOB PREMIER V8

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N4716

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^AThe Posiflex Thermal Printer PP7000, Scanner CD2860 and Cash Drawer CR3100 are available via redemption from MYOB. (Colour of Posiflex hardware may vary due to availability) Product must be registered to redeem. Redemption form from inside the box must be completed and accompanied by proof of purchase. Standard postage of 50c applies to send in your redemption to MYOB

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MICROSOFT WINDOWS XP WITH SERVICE PACK 2

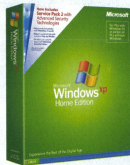
WINDOWS XP SERVICE PACK 2 WITH ADVANCED SECURITY TECHNOLOGIES

Service Packs offer convenient, in-one access to the most up-to-date drivers, tools, security enhancements, and other critical updates. The latest service pack for Windows XP - Service Pack 2 (SP2) - is all about security improvements, and it's one of the most important service packs ever released.

XP SERVICE PACK 2 BENEFITS INCLUDE:

- **Take more control with Windows Security Centre** - here you can check your Windows Firewall, AV Software and Windows Security updates easily in location.
- **Help protect your PC with the NEW Windows Firewall** - a Firewall helps you to guard against unwanted attacks on your PC when you are connected to the internet.
- **Block distracting pop-ups in Microsoft Internet Explorer** - now you have the option to reduce unwanted advertising and content and stop wasted bandwidth by blocking unwanted advertising pop-ups.
- **Attachment Manager** - helps protect against viruses that can spread through E-Mail, Windows Messenger and Internet Explorer by identifying potentially unsafe attachments.
- **Bluetooth Hardware Support** - Bluetooth is the latest in Wireless technology that enables you to link your PC with the latest Bluetooth-enabled wireless devices, including keyboards, mice, printers and mobile phones.

WINDOWS XP HOME - WITH SERVICE PACK 2 INCLUDED



The most dependable Windows operating system yet
Windows XP sets the standard in efficient computing with a new visual design, the reliable Windows engine, and Internet security features.

Handle digital media like a pro

Transferring footage to your computer is faster and editing is easier than ever, with everything you need to create, edit, and share your home movies.

Get connected

Windows XP has built-in Internet, home networking, and real-time voice, video, and instant messaging support. Publish pictures to a Web site or shop online.

Use Remote Assistance to solve problems

Invite a friend or support professional to connect to your PC over the Internet to fix a problem or answer a question.

WINDOWS XP PROFESSIONAL - WITH SERVICE PACK 2 INCLUDED



• Added features

The Professional Edition adds security and privacy, advanced recovery options, improved network connections, and more to the features of Home Edition.

• Superior mobile support

Work offline or access your computer remotely with ease with wireless networking support, configuration wizards, improved power management, and more.

• Greater security

Encrypt your files and folders with the highest levels of protection from hackers and data theft, and connect to Virtual Private Networks securely.

• Integrated and current

Integrate with Windows Servers and management solutions and keep your system current with automatic Windows Update.

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Q0452	FULL	\$295
Q0458	UPGRADE	\$305
Q0455	UPGRADE	\$150
Q0459	UPGRADE - ACADEMIC*	\$120

FOR CURRENT USERS OF WINDOWS XP

If you already own Windows XP, it is strongly recommended by Microsoft to download and install Service Pack 2 (SP2). To do so you can download SP2 or arrange to have it shipped on CDROM.

BROADBAND USERS

Broadband users can download Microsoft Windows XP SP2 (100MB stand alone version). Microsoft has provided SP2 for free download at www.microsoft.com/australia/windows/sp2

DIAL-UP USERS

Due to the large file size of the Service Pack, we don't recommend you download it if you are on a dial-up connection. Dial-up users can instead order a Windows XP SP2 CD online.

www.microsoft.com/australia/windows/sp2

ORDERING

If you would rather have Windows XP SP2 delivered to you, see this web address www.microsoft.com/australia/windows/sp2 to order a CD version of SP2 by mail*
*Shipping and handling costs may apply

WINDOWS XP SP2 - SYSTEM REQUIREMENTS

To install Windows XP SP2 via CD, you need:

- A PC with Windows XP Home Edition, Professional, Media Center Edition or Tablet PC Edition installed
- 233MHz or higher processor
- 64MB of RAM or higher
- 1.6GB of available hard disk space during installation
- CD-ROM drive

*For non commercial use. Must be a Qualified Education User. For eligibility criteria visit: <http://www.microsoft.com/australia/education/howto/buy/meud/studentsandteachers.aspx>

PLEASE NOTE:

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Microsoft® Office Professional Edition 2003 can help you and your organisation communicate information with immediacy and impact. New and familiar programs and improved functionality help you build powerful connections between people, information, and business processes. The most complete personal and business productivity solution available from Microsoft. Get everything in Small Business Edition 2003, plus:

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MICROSOFT DIGITAL IMAGE SUITE 10.0

Offering you an expanded set of tools to fulfil your passion for digital photography in one powerful package, Microsoft Digital Image Suite v10 helps you effortlessly organise, enhance, share and archive your photos. Digital Image Suite includes all the new features found in Digital Image Pro and more, so if you're serious about digital photography, this is the one for you.

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- New Auto fix tools
- Create compelling photos
- Turn your photos into video (Windows XP required)
- Share your photo creations

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*Purchase Digital Image Suite 10 (P7723) between 24th January 2005 and 24th April 2005, fill in the official claim form (available on the Digital Image Suite product box and at microsoft.com.au/imaging) and send it to Microsoft by 10 May 2005 to be eligible to claim the \$50 cash back. Participation in this promotion is subject to the terms and conditions noted on the claim form and on the web at microsoft.com.au/imaging.

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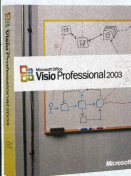


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Visio Professional 2003 gives IT professionals, engineers, and developers comprehensive technical diagramming and drawing tools to create and share information.

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Microsoft[®] Office FrontPage[®] 2003 is the Web site creation and management tool that gives you the features, flexibility and functionality to help you build better Web sites. FrontPage delivers the professional design, authoring, data, and publishing tools customers have asked for to create dynamic and sophisticated web sites.

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MICROSOFT[®] ONE-NOTE[™] 2003



Microsoft Office OneNote 2003, is the Microsoft Office System note-taking and management program that enables you to capture, organise, and reuse your notes on laptop computers, desktop computers, or Tablet PCs. It gives you one place to store all your notes and the freedom to work with them how you want. Use OneNote to capture your thoughts and ideas in an electronic notebook, where you can easily retrieve them.

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[^]BONUS BOOK OFFER



Receive a bonus Microsoft VISIO 2003 guide with each purchase of Microsoft VISIO Standard 2003 and Microsoft VISIO Professional 2003, full upgrade and academic software (boxed versions only). **Bonus Offer** is valid while stocks last.

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[^] See page 59 for details

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